

# The Chemical Age

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**NOTICES:**—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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## Britain's Chance in Chemicals

THE British Industries Fair closed yesterday (Friday) after a successful run of practically a fortnight. The chemical, dyestuff, and chemical plant section maintained to the end its place as the most distinctive and impressive feature of the exhibition. The first impression gained was steadily strengthened as the Fair proceeded that the organisation was an appreciable improvement on that of the previous year. The stands were better arranged, and the total effect, especially on those who made their entrance direct into the chemical hall, was considerably improved. The attendance was large, and the public interest keen to the end. Apart from the purely commercial and technical aspects of the Fair, the general class of visitors who passed through the chemical sections could hardly escape a conviction of the vitality of British chemical industry and the progressive spirit that pervades it. From this point of view success was complete. The

combined effect of the exhibits was educative in the first degree, giving the public a broad general view of what the term "chemical industry" means, and supplying technical and commercial visitors with a rare opportunity of noting points of progress.

This year the real purpose of the chemical exhibition was better understood than last year, and the disappointment resulting from false expectations was absent. It was generally realised that the first object was not a fortnight's successful shop-keeping, but propaganda of a general character for the whole industry. At the same time, the fortnight's work was not without definite results. One noticed the word "sold" attached to numbers of articles on view; substantial orders were booked; most promising of all, inquiries were abundant. As one exhibitor put it: "You never quite know where these fleeting inquiries begin or where they end, but they are always a sign that business is moving and likely to come in your own direction." Judged by this test, the chemical trade would seem to be on the eve of a real revival, and it is satisfactory to find those engaged in it so well prepared to take advantage of the revival when it comes.

Generally, it may be said that this year's chemical exhibition has had a reassuring effect on all who took part in it. The interchange of opinion between salesmen is not by any means the least valuable result; nor is the renewal of the personal touch between seller and buyer to be dismissed as unimportant. Sometimes there is a disposition to undervalue the inquiries when they come from "regular" customers, since on the surface they represent no new ground; on the other hand, we heard satisfaction expressed at the opportunities the exhibition had afforded firms of meeting buyers they were regularly doing business with but had not seen for a year or two. These points of personal contact often count for more than many realise, and they must certainly be reckoned among the good results that can never be completely tabulated.

In the course of discussion some interesting sidelights were thrown on the situation of German chemical industry as affected by the French occupation of the Ruhr district. It is clear already that the effects are bad for German chemical business and good for British chemical business. The drying up of the German sources of basic raw materials and the obligation to obtain them elsewhere, with the incidence of exchange reversed against the German buyer, has had the effect of enormously increasing German costs of production. One effect of this has been seen in the increase in foreign inquiries for chemicals and dyestuffs of British manufacture. We were shown one specific inquiry from Vienna for dyestuffs manufactured by an English firm which, twelve months

ago, would have been obtained almost as a matter of course from Germany. Nor are these inquiries solely due to the restriction of German output and the rise in German costs. They are partly the result of a new reputation which British chemical and dyestuff products are gradually acquiring abroad. Concurrently, our own Colonies are beginning to show a real spirit of loyalty to British industry by definitely placing orders here, even when the price is higher than those of foreign competitors. It was reassuring to hear the director of one of our leading manufacturing and merchanting firms congratulating himself on having foreseen this revival of the British chemical trade and decided long ago, at some sacrifice for the moment, not to handle German products in competition with British. The moral of it all is that the spirited efforts of recent years are beginning to bear fruit, and that the British chemical industry looks like coming into its deserved reward if only the present efforts are loyally maintained.

### The Recent Increase in Coal Costs

THE situation in the coal industry during the past few weeks has been full of interest to those large industrial consumers who have fixed their contracts well forward, and it has been a little alarming to those who live more or less from hand to mouth, or whose contracts have expired or are on the point of expiring. The situation has two sides to it, and it is difficult to say whether, on balance, it is to the advantage or disadvantage of industry in this country as a whole. It is, perhaps, not generally appreciated that under normal conditions some four or five million tons of coal per month are available as a surplus from the Ruhr district, so that a deficiency of approximately this quantity has now to be made good from other sources of supply. Naturally, the coal trade in England is receiving most of the Continental inquiries, and advantage has been taken of the opportunity to raise prices all round.

It is a little galling to those dependent industries to find that, just when trade prospects were beginning to take a hopeful turn, they are faced with a sudden and unexpected increase of some 4s. to 5s. per ton; and, while no one grudges the coal trade the little flutter of prosperity which it is now enjoying, there is some disappointment at the way in which home customers are being treated. The general trend of opinion is that, while Continental demands should be met as fully as circumstances permit, the home consumer should have the first call on available supplies, and should even be given some preference as regards price. Such a policy is not without precedent. It has, for example, been followed for some time by the British Sulphate of Ammonia Federation in connection with their own particular product. It will be deplorable if the strength of the British consumer's case fails to be admitted, and if the advantages of the last two years are thrown away. The only sensible way out of the difficulty is to increase, not price, but output, and there is plenty of scope for improvement in that direction. It is with a certain feeling of dismay at times such as these that one learns of supplies of coal being lost through a strike at one well-known north country colliery.

### Dr. Carpenter Defends the Therm

ALTHOUGH the committee which was appointed towards the end of last year to inquire into the equity of charging for gas by the therm has not yet reported there is a very general impression that no alteration of the existing basis will be recommended. It is as well to recall that the therm was the offspring of an entirely disinterested official body—the Fuel Research Board—and that its genesis was no more the work of the gas undertakings than it was of those plaintive members of the public whose ignorance of simple technical considerations has been mainly responsible for the confusion which has arisen. We are inclined to think, however, that the publicity which has been given to the therm has been to the advantage of all concerned, for not even has the consumer with the most vivid imagination been able to show that there is any connection between the magnitude of gas accounts and the new system of charging. It has been left for Dr. Carpenter to disillusion those who had gained an entirely wrong impression of the new system, and with characteristic candour he told the shareholders of the great undertaking over which he presides that there was nothing wrong with the therm, but that what was wrong was the price which had been charged for it. This self-indictment, coming as it does from the Cromwell of the gas industry, is well calculated to take the wind out of the sails of those irresponsibles who are agitating for a return to the volume basis. The average layman who consumes gas would never be convinced by all the technical arguments in the world. Faced by a simple explanation and direct admission such as Dr. Carpenter makes he is disarmed of suspicion and feels content to let bygones be bygones. And, after all, the gas undertakings have no cause to hang their heads in shame and hide the facts behind the therm. They have been the victims of a series of unfortunate conditions which have been entirely beyond their own control, and they have weathered a succession of adversities which would have dispatched the majority of privately conducted enterprises.

Even now the situation as regards the price of coal and labour and the value of by-products is exceptional; but successive reductions are being announced in the cost of the therm. Perhaps, the most impressive fact, which emphasises the point that when gas is dear the shareholders suffer equally with the consumers, is that for the first time since 1914 the pre-war dividends have just been reached. In the case of Dr. Carpenter's undertaking the rate is even now only 5½ per cent., a figure which appears moderate in comparison with those of other recent declarations by industrial and commercial undertakings. When it is borne in mind that in the United Kingdom there are more than seven million consumers of gas it will be appreciated that those who have raised their voice against the therm represent only an infinitesimal proportion of the gas-consuming public. If any suspicion exists as to the prices which are now ruling for gas we might point out that the increase in cost in the metropolitan area as compared with pre-war rates is well below the official cost-of-living index figure, a fact which indicates that of the necessities of life there must be many items which, proportionally, show very much greater increases in cost than does the commodity supplied by the gas undertakings.

### Rising Prices of German Chemicals

ATTENTION has already been drawn, in our leader on the British Industries Fair, to the restriction of German output and the rapid advance of German prices, and to the effect of these conditions on the British chemical trade. A pointed illustration of this is supplied by a trade circular just received from a well-known German firm of chemical merchants. 'It is printed in English and is obviously intended for the English market. In this document it is stated that the political troubles are having a very bad influence on business, and that owing to the depreciation of the German exchange rates prices are further advancing. The prices quoted (which in numbers of cases we have compared with those in our own market reports and find to be nearly equal) are offered "without engagement," f.o.b. Hamburg, package extra, and also an additional charge of 5 to 10 per cent. for broken packages. "We reserve the right," the circular states, "to convert mark prices into foreign currency at the current rate of exchange, should this be requested by the authorities in order to obtain export license." More significant still is the addition, "Owing to the enormous rise in all articles, we need our whole capital in order to keep business running, and we therefore must insist on payment by cheque or banker's credit at Hamburg when placing the order." In the heavy chemicals section we meet with such comments as "a rising tendency is reported," "recent quotations are higher," "price raised by makers," and "owing to the constant rise of coal prices and freight rates prices have further advanced." To put it rather bluntly, it looks as if German necessity would prove to be Britain's opportunity.

### Good-bye to Newspaper Insurance

A SIGNIFICANT step has been taken by *The Times* in issuing a circular to its registered readers announcing the end of the insurance benefits which were offered when the paper was under the direction of the late Lord Northcliffe. A beginning has thus been made in the work of eliminating from the newspaper business a most undesirable and unbusinesslike feature, which was deplored by no class more than by newspaper men themselves. From the advertisers' point of view the decision is equally welcome, because it helps to restore the business of advertisement to a sound footing. The swollen circulations, due to the largely fictitious attractions of insurance schemes, brought no increased value to advertisers; on the contrary, their announcements were more apt to be lost on a promiscuous crowd of readers. For if there is one sound rule in advertising it is to spend all that can be spared on reaching the right people and to waste neither attention nor money on addressing the wrong people. Concentration, not diffusion, is the secret of success.

On this point there is one sharp distinction between the daily newspaper and the weekly commercial journal. The former serves mankind in general, and one type of announcement may only appeal to a small fraction of the total. The latter, on the contrary, serves selected industries, and thus the appeal goes direct to the right class of people without wastage of cash or effort. It is for this reason that firms are

coming more and more to see the value of intensive as distinct from extensive advertising, and the economy to a direct appeal to the industries they serve.

### Points from Our News Pages

Further notes and photographs are given relating to the chemical exhibits at the British Industries Fair (p. 226). Dr. H. H. Hodgson dealt with the future of the British colour industry at the annual meeting of the Association of Technical Associations on Friday (p. 231). Sir Milton Sharp gave his views on British dyes at the annual meeting of the Bradford Dyers' Association (p. 232). Catalyst poisoning was discussed in a paper by Dr. E. B. Maxted at a recent meeting in Birmingham (p. 233). According to our London Market Report, the position, so far as delivery of foreign chemicals is concerned, is becoming more acute and supplies coming from French-occupied German territory are very meagre (p. 244). Our Scottish Market Report states that there have been more inquiries, although the amount of actual business booked has been relatively small (p. 247).

### Books Received

WHERE TO BUY. Published by S. Davis and Co., London. Pp. 200. 2s.  
THE PROBLEM OF SOLUTION. By Dr. Stephen Miall. London: Benn Brothers, Ltd. Pp. 33. 2s.  
VAT COLOURS. By J. F. Thorpe and C. K. Ingold. London: Longmans, Green and Co. Pp. 491. 16s.  
PARACELSUS. By Joh Maxson Stillman. London: The Open Court Publishing Co. Pp. 180. 10s.  
ORGANIC SYNTHESIS. VOL. II. J. Bryant Conant. Editor-in-Chief. London: Chapman and Hall, Ltd. Pp. 100. 7s. 6d.

### The Calendar

Mar.		
5	The University of Birmingham Chemical Society: "Some Considerations concerning the Chemistry of Fluid and of Dried Milk." L. H. Lampitt.	Birmingham.
5	Society of Chemical Industry (London Section): "Industrial Poisoning and the Works Chemist." T. M. Legge. 8 p.m.	Engineers' Club, 39, Coventry Street, London, W.1.
6	Society of Chemical Industry (Birmingham Section): "The Influence of Protective Colloids upon the Velocities of Chemical Reactions." Dr. J. Newton Friend. 7 p.m.	The University, Edmund Street, Birmingham.
7 and 8	The Institute of Metals: Annual General Meeting. 10.30 a.m.	Institution of Mechanical Engineers, London, S.W.1
7	Society of Public Analysts: Ordinary Meeting. 8 p.m.	Burlington House, Piccadilly, W.1.
8	The Society of Dyers and Colourists (London Section): "The Valuation of Dyestuffs by Titration Methods." R. B. Brown and H. Jordan. 7 p.m.	Dyers' Hall, Dowgate Hill, London, E.C.
8	Institute of Chemistry (Liverpool Section): "Chemical Warfare." Major V. Lefebure. 7.30 p.m.	The University, Liverpool.
9	The West Cumberland Association of Chemists, Chemical and Metallurgical Engineers: Annual Meeting.	Workington.
10	The West Yorkshire Metallurgical Society: "Heat Treatment of Non-Ferrous Alloys." Dr. F. C. Thompson.	City Museum, Leeds.



## Photographs at the British Industries Fair





# Chemicals at the British Industries Fair

## Further Notes on the Exhibits

ALTHOUGH the number of visitors passing through the Chemical Section of the British Industries Fair has been slightly smaller than last week, the majority of the exhibitors appear to have received quite an encouraging number of inquiries, some of which have developed into firm orders. The attendance of foreign buyers has been very satisfactory, the majority coming from Scandinavia, Canada, Japan, China, Finland and Holland.

We give below some further notes on the exhibits of chemicals, dyes and chemical plant, and of the chemical and allied exhibits at the Birmingham Section of the Fair:—

### British Alizarine Co., Ltd.

On the stand of the British Alizarine Co., Ltd., briefly referred to in our last issue, is a showcase containing exhibits illustrating the various stages of the manufacture of alizarine from the raw material to the finished product, the chief feature being glass dishes containing pure anthracene, anthraquinone, and alizarine in crystalline form; these are rare specimens and have aroused much interest. Cotton prints and wool dyeings arranged on counters show the applications of all colours of the alizarine series.

Special prominence is given to the company's new alizarine vat dyes, which are equivalent to the indanthrene colours. A display of dyed cotton yarns testifies to the brightness and level dyeing properties of these colours, and the makers are emphatic in their statement that for fastness to physical and chemical conditions their dyes are equal in every respect to the German dyes of this class.

The company's most recent productions are Alizurrol wool (Acid Alizarine) colours, such as Alizurrol Turquoise (Astrole), Alizurrol Purple (Irisol), Alizurrol Ruby (Rubinol), etc. These are shown separately and in their application to wool and silk. Proof is given of their superiority by means of pieces of wool dyed with their German equivalents.

Another new colour is Alizone Blue, a product hitherto known as Hydron Blue. Specimens of cotton are shown, dyed with this colour and printed with the company's own patented white discharge paste. In this connection the firm state that the Germans have never yet succeeded in getting a full discharge on this colour. A series of chrome compounds, the by-product of the alizarine industry, is also shown.

It is interesting to recall that the British Alizarine Co. are the actual commercial descendants of Perkin and Co., as is well known discovered the first mauve in 1856. A picture is shown of Messrs. Perkin's works, built at Greenford Green, near Harrow, in 1869, and described as "the first synthetic colour works in the world." These works were later transferred to Silvertown and taken over by the British Alizarine Co., who have recently moved to more extensive works at Trafford Park, where they are now actively engaged on research and the production of new colours.

### L. Oertling, Ltd.

One of the novelties to be seen at the stand of L. Oertling, Ltd., is an automatic recording balance for ascertaining the variation in weight of liquids or gas through evaporation. It is very ingeniously constructed, and is worked by a vertical mirror in the balance case reflecting light through a trough on to a revolving drum fitted with sensitive paper, upon which results are recorded by photography.

A micro-chemical balance which is exhibited is built to carry 20 grammes in each pan and to turn with 0.05 milligramme on the ordinary index. The balance is fitted with a concave cylindrical mirror, by means of which the fine divisions on the back of the index are given a magnified reflection—five divisions on the fine scale equalling one on the ordinary index, thus enabling the operator to obtain a direct reading of one division to 0.01 milligramme.

The firm's No. 31a short beam chemical balance is also of considerable interest, as it has been specially designed to counteract the present high cost of manufacture. It contains

all the essentials of the best type of chemical balance at a moderate price. Other balances shown include a variety of models for routine and research work, specific gravity balances, and a balance specially designed for school laboratories. This model has a 10 in. gunmetal beam to carry 250 grammes in each pan and is sensitive to one milligramme.

A striking example of the delicacy of the work embodied in the productions of this firm is contained in their "ten to one" inspector's portable balance for testing weights from 20 kilos to 1 gramme, which is sensitive to 1 decigramme.

A selection of hydrometers, petroleometers, saccharometers, etc., is also shown.

### May and Baker, Ltd.

As May and Baker, Ltd., claim to make and deal in about 6,000 products, the greater number of which are stocked, their exhibit, although it is large and well varied, does not include the full range of their manufactures. Among the preparations to be seen on the firm's stand are strychnine, brucine, bismuth and Rochelle salts, iodine and scale preparations, mercurials, potassium iodide, strychnine, etc.

Among the research chemicals exhibited are malonic acid and its esters, while the range of industrial chemicals includes potassium sulphide and ammonium molybdate.

Resublimed iodine and other iodine preparations are shown, together with a chloride and sulphate-free potassium acetate in granular or stick form. A jar containing remarkably long crystals of ammonium nitrate is also of interest. The range of bismuth salts includes bismuth carbonate (-sub)—an extra light variety of which is made by a special process, 1 lb. of the product being sufficient to fill a 60oz. bottle—salicylate, subnitrate, and tribromphenolate; while among the scale preparations are to be seen iron and ammonium citrate, iron citrate and quinine, iron and potassium tartrate, and iron pyrophosphate and sodium citrate scales.

Tablets of pure sublimed transparent camphor are prominently displayed, particular interest attaching to this exhibit on account of the special branding process adopted, and also for the special transparent wrapping. Soneryl (butyl-ethyl-malonylurea), a new hypnotic of the barbituric acid series, and such anti-syphilitic preparations as arsenobillon, novarsenobillon, eparseno, and luatol, a neutral solution of sodium and potassium bismuthyltartrate, are also shown.

### Johnson and Sons (Manufacturing Chemists), Ltd.

Progress made in the manufacture of British photographic fine chemicals finds striking illustration in the exhibit of Johnson and Sons (Manufacturing Chemists), Ltd., which includes products which were until the war made almost entirely in Germany.

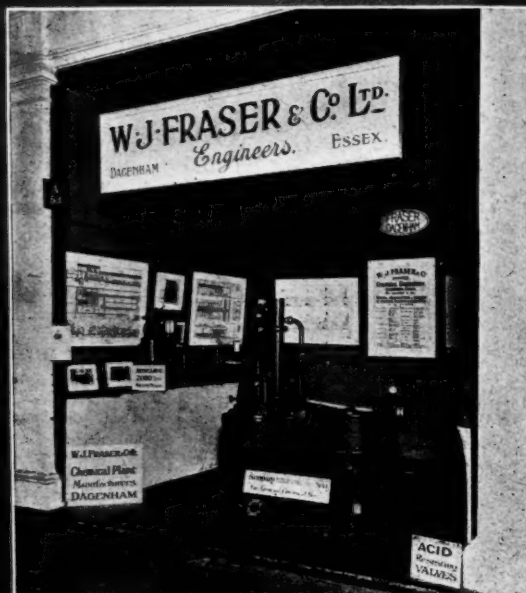
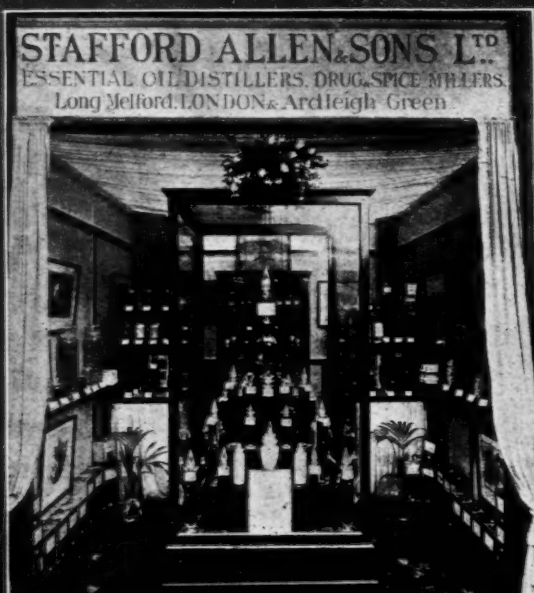
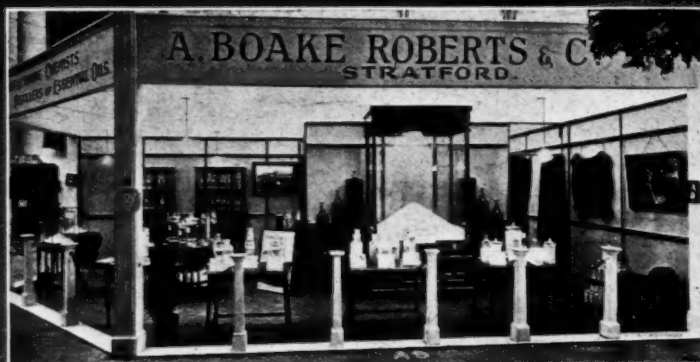
The chemical of the greatest importance in modern photography is undoubtedly monomethyl-paramidophenol-sulphate, which before the war was sold under the names of "Metol-hauff" and "Metol-agfa." Metol has become the most widely used of all developing agents, and has proved itself the best for X-ray and cinematography, whilst in combination with other developers it has become universally adopted for the development of films and plates which have received instantaneous exposure. As evidence of the great value that was set on Metol, it is worthy of note that several substitutes were produced, but Metol-Johnsons is, up to the present, claimed by the manufacturers to be the only production which is the true monomethyl-paramidophenol-sulphate, and which has that pure white crystalline form which the public had been accustomed to receive in pre-war days from Germany.

Other developers such as glycin, paramidophenol, diamidophenol-hydrochloride and azol are also displayed. Hydrokinone is now being manufactured by the firm, but pending the installation of additional plant it is impossible adequately to cope with the demand for this product.

### Hopkin and Williams, Ltd.

This firm have an extremely interesting display, under the care of Mr. H. B. Everson, of specimens illustrating the production of their specialities from the raw material to

## Photographs at the British Industries-Fair



the finished article. Particular interest attaches to their exhibit of monazite sand, which is shown in conjunction with the rare earth salts derived from it, including thorium nitrate and cerium nitrate.

The samples of praeosodymium and neodymium salts are also of special interest to chemists. An exhibit of mesothorium bromide, which, as reported in our last issue, attracted the attention of the King, is derived from monazite residues and is said to be equal in activity to radium bromide.

An interesting feature of the exhibits is a series of photographs of the company's works and mines at Travancore, illustrating the mining and preliminary treatment of the monazite sand before its despatch to their Ilford works for final treatment.

Prominence is given to a collection of radio-active uranium minerals and salts, among which may be mentioned uranium nitrate and sodium uranate. Reagents for analytical and research purposes are also included, together with some very fine crystals of chemicals, sodium bismuthate for manganese estimation, and soda asbestos for CO<sub>2</sub> absorption.

#### Thomas Tyrer and Co., Ltd.

In addition to the well-known ferric ammonium citrate, Thomas Tyrer and Co., Ltd., are exhibiting a series of the corresponding salts of aluminium, chromium, manganese, nickel and cobalt, all in the form of thin transparent scales. The two latter salts, green and pink in colour respectively, form an interesting example of complementary colours, as a specimen exhibited of nickel cobalt ammonium citrate is in the form of grey scales which dissolve to a practically colourless solution.

The firm are also exhibiting a full range of bismuth salts and some very striking specimens of crystallised bismuth metal.

Although their products are mainly inorganic, Messrs. Tyrer are also manufacturing camphoric acid, camphor monobromide, terpin hydrate, etc., excellent specimens of which are displayed, together with a comprehensive range of the most generally used salts of copper, cobalt, mercury, manganese and nickel.

Mention must also be made of the firm's latest addition to the list of "captured" German products—sodium nitro prusside—of which a beautifully crystallised specimen is shown.

#### Stafford Allen and Sons, Ltd.

Samples of English lavender and peppermint oils, distilled from plants grown on their own farms at Long Melford, are to be seen on the stand of Stafford Allen and Sons, Ltd., who also show a range of essential oils distilled by themselves from raw materials which are not produced advantageously in this country, including buchu, fennel, pimento orris and clove oils; very large quantities of the latter oil is made by this firm. Derivatives from oil of cloves include eugenol and iso-eugenol, while among their perfumery products are a number of synthetics known as "Similes," which are highly concentrated for perfumery purposes. They have also a number of highly concentrated synthetics for soap perfumes, among which may be noted Ideal, Trefle and Sasorabia.

Oleo-resins and resins are shown in some variety, as are scale preparations and extracts from home-grown herbs. Included in the display are a number of herbs and roots grown on the company's own farms, such as henbane, belladonna, and foxglove leaves, lavender flowers, dill fruit, and aconite and belladonna roots.

Other specialties shown include geraniol, citral, eucalyptol and anethol.

#### Boot's Pure Drug Co., Ltd.

Fine chemicals shown by Boot's Pure Drug Co., Ltd., include a conspicuous sample of chloral hydrate, beautifully white and crystalline in appearance, and saccharin 550, together with an interesting collection of intermediates and by-products occurring in its manufacture. Alkaloids are represented by atropine, hyoscyamine, quinine and caffeine; antiseptics by acriflavine and chloramine-T; anaesthetics by chloroform and benzamine lactate; and antipyretics by aspirin, phenacetin and salicylic acid.

A notable feature of the exhibit is a new organic arsenical drug, "Stabilarsan," which is a compound of salvarsan and glucose, which is claimed to be lower in toxicity than any

other arseno benzol preparation and sufficiently stable to be supplied in solution form ready for use. Research chemicals in great variety are displayed, and it is interesting to note that an analytical certificate stating the degree of purity accompanies each consignment.

Considerable interest has been aroused by the display of a board containing samples of products arranged to show diagrammatically the manufacture of saccharin from coal tar.

#### Spencer, Chapman and Messel, Ltd.

A very interesting feature of the exhibit of Spencer, Chapman and Messel, Ltd., is a range of jars containing oleum in different concentrations. It is shown that with 20 per cent. SO<sub>3</sub> oleum is liquid, but with 40 per cent. concentration it becomes a crystalline solid, while at 60 per cent. the oleum is again liquid, reverting once more to the solid state when the added SO<sub>3</sub> reaches 80 per cent. The firm claim to be the first to produce these modifications on a practical scale, and the chemist will appreciate the bearing of these forms on the theory of the formation of compounds of SO<sub>3</sub> with sulphuric acid. A flask containing crystals of pure sulphuric anhydride, which may be seen melted and recrystallising, has attracted much attention from visitors. Evidently these substances are of a much higher degree of purity than is usually the case with such products.

The exhibit includes, of course, specimens of the various acids for which this firm is well known. These include sulphuric, hydrochloric and nitric acids. Nitre cake, flowers of sulphur and sodium sulphate are also shown.

#### J. C. Bottomley and Emerson, Ltd.

This chemical and dye manufacturing firm, who have been established at Huddersfield since 1851, are exhibiting a range of their acid, direct cotton and union colours, together with intermediates and general chemicals.

A selection of acid colours is shown, including Tartrine Yellow O in various strengths, Naphthazine Base Black and Acid Blacks, Naphthazine Oranges, Reds, Greens, etc. The Acid Blacks include a series which are said to leave white cotton effect stripes perfectly white.

The firm's direct cotton colours comprise Diazine Direct Blacks, Yellows, Blue 2B, Green B, and Dark Green, while their union colours include a complete range of colours for the dyeing of cotton and wool in one bath.

It is interesting to note that the firm have recently commenced the manufacture of soluble Blue Crystals, of which a sample is shown. Some of their industrial chemicals, such as nitric acid, Glauber salts, nitrate of iron, metachrome mordant, etc., are shown.

#### Powell Duffryn Steam Coal Co., Ltd.

A realistic representation of the "coal tar tree" is the central feature of the stand of the Powell Duffryn Steam Coal Co., Ltd., who, in addition to patent fuel ovoids, are showing specimens of their by-products, which include 90/160 and 95/160 rectified solvent naphtha, 90/190 heavy naphtha, anthracene oil, crude whizzed naphthalene salts in three qualities, with melting points of 58, 70 and 74° C., creosote salts for the firelighter trade, medium soft coal tar, pitch sulphuric acid 138° Tw., whizzed anthracene, creosote oil, benzol and the ground neutral quality of sulphate of ammonia. The extremely fine and dry condition of the sulphate is shown by the ease with which it passes through an hour glass.

#### Brown and Son

This firm are exhibiting a varied collection of their manufactures, including a bomb calorimeter, which was only recently placed on the market. Autoclaves, fitted with the firm's patented self-sealing cover, which obviates the use of bolts and nuts, figure prominently in the display. Another interesting exhibit is a patent combined still, oven and evaporating pan, which has been specially designed for use in research and other laboratories where a variety of small drying and concentrating operations are frequent. Messrs. Brown also manufacture all classes of steam pans, vacuum stills, condensers, Soxhlet extractors, drying cupboards, emulsifiers, etc., in copper, steel, and enamelled iron.



### Marley Hill Chemical Co., Ltd.

Among the principal products of the Marley Hill Chemical Co., Ltd., displayed on their stand are samples of pitch, refined tar, benzole (crude and refined), solvent naphtha (crude and refined), pickling creosote and wash oil, various qualities of anthracene, sulphuric acid, neutral and ordinary quality sulphate of ammonia, sal ammoniac, ammonia liquor, burnt oxide, sodium ferro-cyanide and crude naphthalene. The company's works consists of 90 Hussener type coking ovens, a tar distillery, and plant for the manufacture of sulphate of ammonia, sulphuric acid, etc. Pamphlets descriptive of the company's products in English and French are distributed from the stand.

### Acme Chemical Co., Ltd.

Quassia chips for various industrial purposes figure prominently in the display made by the Acme Chemical Co., Ltd., who also prepare a concentrated extract of quassia and log-wood chips from best Indian wood.

Another of their specialities to which special attention is drawn is an exhibit of "Acme" arsenite of soda, which, in addition to its well-known use as a cattle dip, is finding application in the destruction of the prickly pear. An arsenate of lead paste which is claimed to be safer and more efficacious than Paris Green is also shown.

### Bennett, Sons and Shears, Ltd.

Still, vacuum pans, steam jacketed pans, mixing vessels, and mulseres are among the chief manufactures of Bennett Sons and Shears Ltd., who are exhibiting their "Ideal" patent condenser, which is designed for use with stills of all designs, vacuum stills and pans. It can be connected direct to steam mains for the production of pure distilled water, and is also suitable for engine condensers and fume condensers. The firm manufacture high pressure autoclaves of various designs, one of which is exhibited, together with a copper still.

### Landore Zinc Works, Ltd.

Oxide of zinc manufactured by the Landore Zinc Works, Ltd., at Swansea, is exhibited by the company's sole selling agents, Taylor Brothers and Cox, Ltd. The oxide is claimed to be extremely white and of a quality equal to any imported before the war. Production is said to be already equal to all requirements.

### Widnes Foundry Co.

This firm specialises in all kinds of heavy and fine chemical plant of which illustrations are exhibited. Attention is drawn to their mineral oil plants, their equipments for the coal tar and by-products industries, plant for the treatment of oils, fats, glue, gelatin, enamel, and vegetable by-products.

### Typke and King, Ltd.

A pleasantly-arranged stand houses the products of Typke and King, Ltd., who show a variety of chemicals used in the rubber industry. The exhibits include sulphides of antimony, arsenic, cadmium, lead and zinc; hypophosphite salts, antimony compounds, green oxide of chromium, etc.

### W. Neill and Son, Ltd.

Soap-making plants on a large scale are specially mentioned among the products of this firm who have long been known as general chemical plant manufacturers.

### "The Chemical Age Year Book"

RECENT appreciations of *The Chemical Age Year Book* and of THE CHEMICAL AGE received from subscribers include the following:—

"The *Year Book* is certainly in keeping with THE CHEMICAL AGE, both being of a very useful character."

"I look forward to the publication of THE CHEMICAL AGE because it supplies not only information from trade sources and pure chemistry, but all intermediates."

"I consider this publication to be of invaluable assistance with its wealth of facts and information to all workers in chemistry, physics and engineering. With best wishes for the success of the best chemical weekly published."

Regular subscribers who have not yet received copies of the *Year Book* are advised to communicate with the Manager at 8, Bouverie Street, E.C.

## The Birmingham Fair

FROM OUR OWN CORRESPONDENT.

The Birmingham Section of the British Industries Fair opened at Castle Bromwich on February 19, and the Lord Mayor, who was presented to the King and Queen at the White City on Monday, presided at the luncheon of the Council on the following day.

The Fair is not so large as last year, due to the absence of a number of very large exhibitors, but there is a substantial increase in the number of small stands. Two huge aerodromes, each 150 yards long and 100 yards wide, and a large corridor, are crowded with stands, chiefly of hardware and the allied trades, engineering and building construction—altogether a display of great industrial interest to overseas buyers.

Again a number of firms who are interested in the chemical trades have exhibits. THE STAFFORDSHIRE MOND GAS CO., of Tipton, have a display which serves to emphasise the potentialities of coal and its by-products. They show a wide range of specialities derived from by-products in the manufacture of Mond gas, these including oils which are free from poisonous substances, such as carbolic acid, but which have a germicidal value far superior to it. These oils form the basis of a unique series of disinfectants, sheep dips, cattle washes, etc., all of which show great potency in destroying the lower forms of life, such as disease germs, parasitic and fungoid growths, but they are innocuous to the higher forms of life. Bituminous paints and preservative stains are also exhibited.

The display of the HOCKLEY CHEMICAL CO., Birmingham, manufacturers of chemicals, lacquers, polishing materials, etc., emphasises the great part which chemicals play in modern manufacture. Lubricants for cutting tools, compounds for giving a hardening case to metal and plating barrels (the last-named in operation), constitute a source of much interest.

Spray outfits, wood polishes, and coloured lacquers for electric lamps are features of interest at the stall of the FRED CRANE CHEMICAL CO., LTD., of Birmingham. The celluloid enamels, white and black, the latter for motor work, attract much attention by reason of the fine effects obtained. With the white enamel a marble-like appearance is obtained, this being very suitable for bathroom and similar equipment.

THE BIRMINGHAM GAS DEPARTMENT have a demonstration stand, on which they reveal the large part which research work at their laboratories is playing in industry, particularly in relation to metallurgical industries.

THE MIDLAND FAN CO., Birmingham, make a special feature of spraying plants, varnishes and lacquers; and the AEROGRAF CO., LTD., London, show the immense advances which have been made in regard to painting, etc., by spraying means.

THE NATIONAL BENZOLE CO., London, show motor fuel and lubricating oil; while decorators' soap is featured by MR. ANDREW MAXWELL, of Liverpool. FITCHETT'S, LTD., Birmingham, exhibit a variety of hand pastes for removing grease and other stains, as well as soaps and soap powders.

MESSRS. W. CANNING AND CO., Birmingham, have a comprehensive display of electro-plating equipment; nickelling and zinc salts, etc., used in manufacture, as well as polishes and lacquers, are also displayed.

NECOL INDUSTRIAL COLLODIONS, LTD. (Nobel Industries, Ltd.) show bronzing liquids, textile stains for decorative effects and celluloid (cold drying) enamels; and LIGHTING, LTD., Manchester, aluminium and vitreous enamel suitable for half watt lamps.

ACKROYD AND BEST, LTD., Leeds, have a stand upon which refractory furnace cements, and a variety of products for the mining industry are displayed, and MESSRS. CHARLES A. WILLIAMS, Birmingham, give prominence to drysalts' manufacturing goods and soaps, oils, chemicals, and materials for the use of French polishers.

### A Desk Calendar

ONE of the neatest contrivances we have seen for the desk is forwarded by W. C. Holmes and Co., Ltd., plant manufacturers, of Huddersfield. A holder constructed of metal is designed to serve the combined purposes of calendar, paper weight, clip for loose slips of paper, and memorandum pad. It is strongly made and as refills can easily be obtained its use does not cease with any particular year. Quite a welcome desk companion, which subtly keeps the name of the firm constantly before one.

# The Future of the British Colour Industry

## Its Dependence on Research

At the annual meeting of the Association of Technical Associations opened in the Carpenter's Hall, London, yesterday (March 2), and continued to-day, Dr. Herbert H. Hodgson, head of the colour chemistry department of the Technical College, Huddersfield, presented a paper on "The British Colour Industry: its Dependence on the Place of Research in the Scheme of Higher Education."

### The Problem of Key Industries

Discussing first of all the general problem of key industries Dr. Hodgson said that when Britain supplied the world with textiles, iron and steel goods, coal, etc., and also carried the exports and consequent imports in British made ships, the idea of key industries did not arise; rather was it a question of our monopoly. But the development of chemical science and its industrial exploitation by Germany brought about an entirely new international situation, nothing less than the established fact that a flourishing all-round chemical industry was essential to the continued success and progress of all great manufacturing activities.

"The Germans," he proceeded, "believe themselves to be in possession of certain indispensable industries, and they go so far as to urge that any transplanting of these to other countries must be prevented. Further, they provide that raw material of foreign import should be home produced or supplanted as far as practicable by a more efficient German substitute. Of their finished products, dyes and certain chemicals of an industrial and pharmaceutical character are even held to be inimitable, a quality also believed to apply to their schools and Research Institutions, while the vital contact existing between scientific investigation and practical application is certainly unique. The American summary of German intentions reveals that no alien capital shall have any interest in an invaluable German monopoly, and to keep the latter at maximum efficiency in the future trade conflict, pace must be maintained even with the minutest improvement. To this end every scientist and inventor in the contemplated dispensation will be compelled to reveal his discoveries instantly to the monopolies interested, while an hereditary personnel will be brought into being to maintain the pall of secrecy. The writing on the wall as to the future thus seems to be no less plain than it was in the past. So much then to emphasise anew the basic character of key industries.

"I have answered by an emphatic affirmative the query as to whether it is of material importance to establish an organic chemical industry in England. Germany has found it profitable in the past to the extent of an export chemical trade attaining almost 100 millions sterling per annum, a figure best realised by the comparative statement of its being about twice our coal export, or equal to our coal and steel export combined; or our total export of cotton goods to all countries. The output of dyestuffs alone was 135,000 tons per annum, of which we purchased 21,000 tons. Our share of these chemical exports, manufactured in Britain, would find legitimate work for an army of men, but instead of such being the case, the existence even of our great export textile trade was actually threatened by the advancing German industry through enjoyment of dyestuff monopoly. It is well to remember that no less than 80 per cent. of our dyed goods are sold abroad, so that a fatal blow to our prestige is always possible so long as our dependence exists upon external dye-producing nations.

### The Synthetic Dyestuffs Industry

"I turn now to the greatest key industry of all—the manufacture of synthetic dyestuffs—an industry which once established permanently will prove the greatest source of well-being to our nation as yet conceived. It is the industry in which imagination must find play to its fullest extent, where a great number of its products in turn form the basis of other essential industries, where the personnel must have the best scientific training possible since the highest mental powers are demanded, where the work is always progressive and eventful, where the potentialities are bewildering in their immensity, where in short our very future itself is created and fashioned. The whole routine of the world can be changed by a single discovery. What a weapon to possess as a monopoly!

"From another aspect the colour industry can be a source of new professions, the pioneer of hope for men who desire a career in other directions than that of the Civil Service, and by its normal expansion and its stimulating effect upon other branches of industry, a rational means for the evolution of the unemployed problem by the creation of brand new industries. I firmly believe the statement that 'it is of greater importance to Germany that the British fine chemical industry should be destroyed than that we should reduce our Army and Navy to microscopical proportions.' By releasing the stranglehold upon our normal trade expansion, we have 'its potentialities for peace' as a very real asset; its addition to usefulness in the service of medicine and public health cannot be overestimated.

"We attempted and with success during the war the improvisation of methods of manufacture for the supply of essentials, but at great cost, although this fact alone has established the temperamental fitness of our countrymen for the industry. Since the war we have witnessed the existence struggle of the British colour industry, to an accompaniment of a storm of hostile criticism self-contradictory and obviously inspired. No allowance appears to have been made for the fact that Germany has had an intensive student period of nearly 50 years, and that the fruitful results of the concentrated research of a whole generation are embodied in their magnificently equipped factories. No notice either has been given to the future outlook should the keys be thrown away and the status quo of 1914 resumed, nor do we find any mention in the tumult of criticism of difficulties encountered in other countries besides our own. Expediency and opportunism appear to me to have dictated the whole of the fury. The present paper has been conceived in the belief that the British colour industry in a very short time will be regarded not only as a permanent institution, but as a tribute to our perseverance and ability. Its author holds with Sir W. Pope that but a few years are required for the organisation and building up of a complete network of fine chemical industries, and that it would be disgraceful if we should fail.

"The great slump in trade has affected the infant dyestuffs industry as much as, if not more than, any other branch of trade, since it is particularly sensitive to fluctuation, and the volume and nature of its operations have been well said 'to mirror faithfully both the unrest and the well-being of the industrial state.' But the point of my paper is that in fair weather or foul, neither the dyestuffs, nor the fine chemical, nor any other industry dependent upon scientists for its progress, will be able to survive external competition of a kind which Germany, America and Japan are capable of exerting, unless the requisite creative atmosphere is generated within the walls of our schools, and our standards of intellectual attainment raised to a much higher level than at present obtains.

"It has been urged that the dyestuffs industry must grow from within, but if the external environment be not favourable that growth will be unnatural and doomed to failure from the outset. 'German chemical industry has been one stupendous organisation for effecting and promoting the application of science to industry.' But this implies two factors, and without the science factor the industrial cannot exist. It is well to remember, that so far as the dyestuffs industry is concerned, it is entirely the outcome of scientific research, and experience has already demonstrated that in normal times a constant flow of new colours is necessary for the maintenance of those dye-using trades which are subject to outside competition.

### Research the Life-blood of the Dyestuffs Industry

"While research is the very life-blood of the dyestuffs industry, I hope to demonstrate that research activity is the basis also of all social progress, and demands incorporation even from this viewpoint as an integral part of our educational system. . . . Prior to 1914, industrial life was separated by a great gulf from academic and professional activities. Our best intellect, as discovered by our educational system, neither entered industry nor had any intention of adopting a scientific profession such as that of chemistry. This attitude, for which



economic circumstances are alone responsible, has resulted in a most harmful consequence—the general failure of those not directly engaged in productive work to realise the extent to which the well-being of the whole community depends upon industry. Naturally a corresponding antagonism existed on the other side. It must be borne in mind that even now, in spite of the lessons of war, the Civil Service alone offers reasonable financial inducement to ambitious men devoid of private means, whilst the entrance thereto is safeguarded against favour and wire-pulling. In consequence, the majority of our brilliant scholars are to be found in the Government service. What could be expected otherwise, when an income of £800 to £1,000 a year, together with congenial surroundings, and a comfortable pension, are pitted against the sordid environment and previous tenure of the pre-war industrial-chemist? But the process of absorption into the Government service does not cease with the top men; those who come next together with good men who have been unable to enjoy a University career, find the lower grades of the Civil Service much more attractive than the life of penury and uncertainty which industry foreshadows.

"When, therefore, we compare pre-war English and German chemical ability, the above facts must not be neglected, and any theory based on such a comparison, which attempts to exalt the German as one apart, even as something chemically occult, has to grapple with the solemn fact that our best intellect, so far as it is revealed by scholastic agency, has never yet taken part in the industrial competition. The German, on the other hand, enters industry at ages varying from 24 to 26; for him the decision rests between Industrial and Government Service, and with approximate equality of condition, his temperament and inclination alone make the choice.

#### A Network of Research Colonies

To get the requisite scientific genius a virile industry, Dr. Hodgson urged, must exist capable of utilising and developing such, and thereby affording a career with security of tenure for reasonable periods of time. There was a paramount need for a large number of active research centres, whose members fully realised that success to their efforts led to a career in industry; in other words, a system of reciprocity between school and industry must be established. He suggested a network of research colonies working in co-operative harmony with industry. Such colonies must be of dimensions whereby their directors should not be prevented by details of organisation from actual personal participation in research work. He insisted on this pivotal principle, because our industrial as well as our political outlook was towards mass production, centralisation, large cities, big schools, etc., the reasons for which had appeared fallaciously sound, but the schemes in practice were proving impossible owing to human limitations. Any man, however great his genius, was very finite in capacity either for organisation or research, and as soon as the demands of business or science transcended this capacity then waste and inefficiency resulted. Therefore a large number of small colonies were desirable. By this means a large amount of individual responsibility would be conferred.

Dealing with his own subject of chemistry, in which such a large scale experiment could probably be attempted with the greatest probability of immediate success, he suggested that no chemical department should be without a definite and distinct research section. Preferably this should be controlled and inspired by the head of the department, and at the earliest stage possible students should be initiated into the methods of scientific inquiry. The entire staff, however, should have service in the research section as part of their duties, but with safeguards for their individual expression. An important result to be expected from the new development would be not only the discovery of research capacity but also the attraction of the right type of student. Routine courses would then be accelerated, and at a suitable point well within the ordinary student course teaching via research methods could be introduced. From his own personal experience of nearly five years' practice in Huddersfield of what he was advocating, he could safely predict that an enthusiasm would be developed which would carry the student forward on the crest of a wave of worthy ambition. Colonies developed on such lines would not last long before that contact with industry, so necessary for national security, would become an established fact.

## Dye Users and British Dyes

### Sir Milton Sharp suggests a Direct Subsidy

PRESIDING on Wednesday at the annual meeting of the Bradford Dyers' Association, Sir Milton Sharp, in dealing with the controversy on the Dyestuffs Act, said that a great deal of nonsense had been spoken and written on the subject.

#### Consumption of British Colours

The dyemaking industry must be treated in an exceptional manner. The Dyestuffs Act was passed by Parliament to ensure such exceptional treatment, and he had no sympathy with the outcry for its repeal. Though he did not entirely agree with the way in which, up to now, it had been administered. Speaking generally, he said, it was doing effectually the work for which it was designed. From 1910 to 1914 inclusive, our consumption of British-made colours averaged 22 per cent. of our total; in 1922, 77.66 per cent. of our total consumption was British-made colours. The general demand to-day was for superior qualities in dyed goods to those prevailing before the war, and he had no hesitation in saying, on the positive assurance of his chemists, that they had been able to satisfy this requirement, and to improve upon their former standards. He did not attribute this to the use of a greater proportion of British-made dyes, but to the fact that we were now using dyes of a superior quality to those in general use pre-war. He was glad to state, however, that British makers were extending their ranges of the better types of colour, although they were, he thought, still a long way from supplying the varieties of these better types equal to the extensive ranges produced by some of their Continental competitors.

#### Reason for High Prices

There was one aspect of the dye question on which Sir Milton Sharp said he wished to speak with extreme plainness, and that was the grossly unfair incidence of the manner in which the establishment of the dyemaking industry was being brought about. The whole burden was being put on the textile and other dye-using industries, whereas, since the establishment was a national necessity, the cost surely should be a national obligation. The present cost of dyes was much too high in comparison with the general economic level of other commodities, as the following figures showed: Taking the basis of our dyeware price in 1913 as 100, in 1922 the average price rose to 422, an increase of 322 per cent., whereas, according to the Board of Trade *Journal*, the average wholesale price index number for 1922 was 158.5, or an increase over 1913 of 58.5 per cent., and it behoved dye users to watch with the greatest closeness how far the prices they were paying to-day—which were undoubtedly high owing to the incidence of the Dyestuffs Act—were causing loss of business which was going to foreign competitors. Some of these foreign competitors were getting German reparation dyes at much lower prices than they were. On the other hand, the Government by the sale of reparation dyestuffs at very high prices had been making substantial profits aggregating hundreds of thousands of pounds. He was in wholehearted sympathy with the suggestion of the Colour Users' Association that the proceeds of the sale of reparation dyestuffs should be utilised as a contribution by the Government towards establishing the dyemaking industry.

#### Government Profits on Dyes

The chairman then referred to a report issued by the Government Staff News Association, in which it was stated that in the period ended March 31, 1921, the Government made a profit of £228,000 on dyes. To-day, doubtless, there were factors—exchange especially—affecting foreign competition which overshadowed and outweighed any difference in the cost of dyes, but, nevertheless, every item in the cost of production must be scrutinised if they were to regain their 1913 volume of exports, and if the Government were still convinced that the establishment of the dyemaking industry was essential to the national safety, the fairest course would be to resort to direct subsidy instead of placing the whole burden on the textile and other colour-using industries. He could not conceive that the Government with a proper realisation of the facts would prejudicially affect the huge volume of exports of manufactured goods dependent on dyes.



## Dr. Maxted on Catalyst Poisoning

### Recent Theories Discussed.

"CATALYST POISONING" was discussed in a paper by Dr. Edward B. Maxted, chairman of the Birmingham and Midland Section of the Society of Chemical Industry, at a meeting on Monday, February 19, at the Chemical Society of the University of Birmingham. Dr. Morgan, Professor of Chemistry at the University, presided over a large attendance.

Dr. Maxted pointed out that historically the phenomenon of catalyst poisoning was observed almost concurrently with the phenomenon of catalysis itself. It was early noticed that catalyst poisoning took place—he was almost tempted to say exclusively—in heterogeneous systems, in which the catalyst was present as a solid. Thus, the oxidation of sulphur dioxide to trioxide in the presence of platinum or other solid catalysts, the catalytic hydrogenation of unsaturated compounds in a liquid or gaseous condition, the decomposition of hydrogen peroxide, the union of hydrogen and oxygen in the presence of platinum, and the synthesis of ammonia, were all catalytic reactions which were extremely susceptible to poisons, while cases of homogeneous catalysis, such as hydrolysis or esterification in liquid systems, in which the most common catalysts were hydrogen or hydroxyl ions, were not subject to this inhibition by small traces of impurities. A typical example of the sharp difference between heterogeneous and homogeneous systems from this standpoint was to be found in the decomposition of hydrogen peroxide by the action of finely divided metals and, for instance, by iodine ions, respectively. In the first case, as was found by Bredig, poisoning only too easily took place. In the case of catalysis by means of a soluble iodide, any foreign additions to the system only affected the activity of the homogeneous catalyst as they affected the concentration of the iodine ions according to the law of mass action.

### Causes of Poisoning

The confinement of poisoning to solid catalysts only suggested long ago that the poisoning effect was due to the obstruction of the catalytic surface by means of the poison, in such a way that the reacting system proper no longer had free access to its normal catalytic seat of reaction. Faraday, who studied the inter-action of hydrogen and oxygen on platinum plates, recognised *a priori* that a platinum surface which was covered by a film due to handling, or to exposure to dust-laden air, could not act normally. He recognised, further, the similarity between the inhibitive action of a fat film and of the surface film formed, for instance, by exposing platinum to the action of hydrogen sulphide. Poisoning was thus occasionally mechanical—for instance, by a film of fat or dirt or by the accumulation of a solid deposit.

### Pseudo-Chemical Poisoning

Poisoning was, however, far more pseudo-chemical, and due to the accumulation on the catalytic surface of the so-called poison. It followed as a natural consequence that, if a given catalyst were poisoned chemically or pseudo-chemically by a given inhibitor, this catalyst would absorb the inhibitor; for it was due to the strong, and what might be called the preferential, adsorption of the given inhibitor that poisoning took place. The degree of the adsorption which took place, owing to this affinity and the laws which this adsorption followed, had only been investigated up to now in a few isolated cases; but in each instance it was shown that strong adsorption of the inhibitor accompanied the poisoning action. Thus, carbon monoxide, which was a well known catalyst poison towards finely divided metals in many reactions, was tenaciously adsorbed by these. A large proportion of the absorption of carbon monoxide, for instance, by nickel was confined to the surface, and was thus true adsorption, since nickel powder possessing a relatively great ratio of surface to weight absorbed far more carbon monoxide per gram than a specimen with a relatively low surface.

It was not sufficient, the author pointed out, for a body to be adsorbed to a considerable degree in order that poisoning might take place. Relatively large quantities of hydrogen were absorbed by a number of metals, but adsorbed hydrogen did not usually act as a poison towards the activity of the metal for other reactions. It was, however, as far as was known, essential to the exercise of a poisoning effect that the body adsorbed should be tenaciously held in such a way that free evaporation of the adsorbed molecules and their free

replacement by molecules of the reacting system did not take place; in all probability the lack of free evaporation of the poison from the surface of the catalyst constituted the cause of the inhibitive action observed.

The inhibitive action of soluble salts of various metals on the activity of platinum for reactions such as catalytic hydrogenation or the decomposition of hydrogen peroxide had also been investigated. Poisonous action presupposed adsorption. Even non-poisonous salts in aqueous solution were adsorbed by finely divided materials, but the amount adsorbed was in general slight only. Preferential and obstructive saturation of the secondary valencies of the catalyst by the poison was observed very strikingly in connection with catalytic hydrogenation. It was probable that an essential step in the activation of hydrogen consisted in its association with the metallic catalyst in such a way that it passed into the so-called occluded condition; and on saturating these valencies with poisons, the capacity for occluding hydrogen vanished. The valencies which held the hydrogen to the catalyst were secondary or subsidiary, the real difference between these and true chemical linkages being, however, probably more one of degree than of nature. Poisoning might be specific rather than general, the author pointed out, for what was a poison for a given reaction with a given catalyst might be harmless for a second reaction with even the same catalyst or even for the same reaction with a different catalyst.

### Conclusions

Dr. Maxted concluded with the following summary:—

1. Catalyst poisoning consists of the preferential adsorption of the poison by the catalyst, in such a way that the secondary valencies of the catalyst, in place of being free for transitory association with the normal reacting system—the probable mechanism of ordinary catalysis—are obstructively saturated by the poison. By obstructively saturated is meant that the free evaporation of the adsorbed poison from the surface of the catalyst and its replacement by the normal reacting system does not take place—or, at all events, not readily.
2. From the above it follows that if a given inhibitor poisons a given catalyst, then the catalyst will adsorb the poison. The adsorption of a poison by a preliminary charge of catalyst may in some instances be used to purify a reacting system; but in most cases the amount actually removed by a given weight of catalyst is too small for the method to be used practically.
3. The activity of a catalyst during the first stages of poisoning is a linear function of the poison content, and the form of the poisoning curve is intimately connected with that of the adsorption curve.
4. The general type of the reaction curve is not affected by the presence or absence of a poison insufficient in quantity for the complete suppression of activity, provided that the concentration of the poison on the surface of the catalyst does not change during the reaction, and provided also that the form of the catalyst does not change.

### Explosion at a Helium Plant

AN explosion, which occurred at a helium purification plant at Langley Field, Va., U.S.A., has raised an interesting point. It was suspected at first that this was due to helium exploding in some way, which would be disquieting in view of the fact that this gas has now an increasing use in balloons owing to its supposed absolute freedom from accidents of this kind. It is now officially reported that the explosion was in no way due to helium but that the accident occurred in a liquifaction plant used for removing air from the gas when the plant was under test.

### Society of Chemical Industry

It is announced that the annual meeting of the London Section of the Society of Chemical Industry for the election of members of committee will take place on May 7. The following members of the present committee retire under Rule 7 and are ineligible for re-election: J. L. Baker (vice-chairman), B. Dyer, W. R. E. Hodgkinson, S. Miall and H. P. Stevens.

The next meeting of the Section will be held on March 5 at the Engineers' Club, London, at 8 p.m., when Dr. T. M. Legge will deliver an address entitled "Industrial Poisoning and the Works Chemist."

## Glasgow Chemical Societies

### Proposals for Fuller Co-operation

A JOINT dinner, attended by representatives of various chemical societies, was held at Glasgow on February 23. Represented at the function, which was associated with the memory of Sir William Ramsay, were the Society of Chemical Industry, the Institute of Chemistry, the Society of Dyers and Colourists, the Glasgow University Alchemists' Club, the Andersonian Chemical Society, and the Ardeer Chemical Club. Professor G. G. Henderson presided, and a large company included Dr. E. F. Armstrong, president of the Society of Chemical Industry.

Mr. Charles R. Gibson, in proposing the toast of "The Joint Chemical Societies," reviewed the work and aims of the various societies represented. He said that societies such as these gave an excellent medium for students communicating their ideas to others, and at the same time broadening their interests beyond their ordinary class and text-book work, and he would suggest, now that the University and the Royal Technical College were affiliated, that those two students' organisations might also form an affiliation. Referring to the Ardeer Chemical Club, the members of which were the research staff of Messrs. Nobel's Explosive Works at Ardeer, he said it was to the credit of this great firm that they had realised the soundness of investing money in scientific research. Were this done more generally there was no doubt that it would be for the benefit of all our great industries. All these societies were links between academic and industrial chemists.

The Royal Philosophical Society was, he believed, the oldest scientific society in Glasgow, having been in existence for 120 years. Could this old society not be a mother to the various local scientific societies? Personally he would like very much if the local chemical societies would propose to the Council of the Philosophical Society that they were willing to form a chemical section on such lines, and he felt sure that the council would not fail to entertain the suggestion and welcome its fulfilment.

### Status of Chemists

The Chairman, in responding, said the desire for closer co-operation and co-ordination of effort on the part of all the societies which were interested in chemistry found expression some years ago in the institution of a Federal Council of Pure and Applied Chemistry, which was intended to be a super-organisation representative of all the chemists in the country. So far the Federal Council has distinguished itself by its quiescence. Quite recently, he said, it had given indications of increasing activity, but it required the ungrudging support of all the chemical societies in order to fulfil the functions which it was instituted to carry out. There had, he thought, been a lack of support arising from an idea that the societies, in too keenly supporting the principle of federation, might to some extent lose their individuality. That, however, was a mistaken idea. In co-operation they had a two-fold object. In the first place they wished to impress upon the public the fact that the profession of chemistry was one of the most important, if not the most important, in the country, and that chemists could claim at least an equal status with other professions. He said that as chemists they knew that every manufacturing industry was directly dependent upon chemistry, but the people at large did not realise that fact. Their work did not appeal to the eye as did that of the engineer, and they had been somewhat remiss in not informing the people of its enormous importance. There were men among them who could explain the great achievements of chemistry in language that could be understood by the multitude, and he was glad to say that the various societies were now making an effort to educate the people to the fact that the future prosperity of the country was to a large extent linked up with the development of chemical science.

### British Arca Regulators, Ltd.

A COMPANY of the above title has recently been registered in this country. We understand it to be an offshoot of a Swedish company which specialises in manufacturing automatic regulators for the regulation of steam, gas and water pressures, humidity, temperature, electric current, etc. The address is Windsor House, Victoria Street, S.W.1, where all inquiries should be directed.

## Badische Company's Agreements

### Rumours of British Contract Denied

WRITING from Berlin on Wednesday, a *Times* correspondent recalled the fact that when the terms of the contract between France and the Badische Anilin-und-Soda Fabrik were being discussed in the French Chamber recently the company sought to ward off much of the hostile criticism levelled at it by the declaration that this agreement had been concluded under duress in 1919 with the knowledge of the German Government of the day. Dr. Becker, the German Minister for Economy, has now declared that the statement that such an agreement was either known to the German Government or received its sanction is entirely false. The German Government, he states, has had no previous intimation of the agreement whatsoever.

This statement is said to have been made before one of the Reichstag committees, and the conduct of the company was sharply criticised by members of the various parties, including the Centre, whose representatives declared that the agreement was of benefit not merely to French agriculture but also to French militarism, and that it was exceedingly regrettable that a German company should have concluded such a contract.

Dr. Becker's statement coincides with the publication of a *communiqué* from the same company purporting to give the real facts about rumours which, it appears, have been current in England during the last few days. The company declares that it has concluded with England no such agreement as it concluded with France. With regard to the English enterprise mentioned in the Press, Dr. Becker states that what is involved is an experimental testing station of Brunner Mond and Co., Ltd., who have been granted by the English Government, under clauses of the Peace Treaty, the corresponding patents of the Badische Anilin-und-Soda Fabrik, without, however, the co-operation of the company in their exploitation.

## Alcohol Fuel

### Some Promising Methods of Production

THE use of alcohol as a motor fuel is increasing slowly. The difficulties in the way of rapid development are many, not the least being the fact that alcohol, being chemically different from petrol or benzol, requires either slight alterations in the design of the motor as well as the carburetter to obtain satisfactory results, or else a fairly high proportion of other bodies such as ether and amyl acetate must be added to adapt it to existing engines. Experiments are proceeding in both directions, and a number of fuels are already marketed of a suitable kind, among which may be mentioned Discol in this country and Natalite in South Africa. Though the price is favourable, it requires reducing further to become a successful competitor to petrol.

This may be developed along the lines of Ernest Bury's experiment at Skinningrove Iron Works in obtaining alcohol from ethylene in coke oven gas at the rate of 1½ gallons per ton of coal, a yield which it may be possible to improve. Other promising methods suggested are the fermentation of potatoes in this country, and of the wild prickly pear in South Africa. At present the industry is somewhat hampered by the Customs and Excise regulations regarding denaturation, and it would be greatly assisted by the overdue revision of these.

### Sulphate of Ammonia Federation's Successful Claim

ON Monday Mr. Justice Rowlatt resumed the hearing of the action by the British Sulphate of Ammonia Federation, Ltd., against the Clan Line Steamers to recover the sum of £146 19s. 4d., the value of 40 bags of sulphate of ammonia delivered to the defendants or their agents as bailees on or about October 15, 1920, for transit from Birkenhead to Mauritius. The defendants denied that the bags were delivered to them or that the plaintiffs had suffered loss or damage. They also alleged that receipts were given for the quantity the defendants received for shipment, viz.: 960 bags. They denied that they received 1,000 bags as alleged by the plaintiffs.

His Lordship gave judgment for the plaintiffs for the amount claimed with costs, holding that the defendants had delivered to them 1,000 bags.



### Research into Non-Ferrous Metals

THE British Non-Ferrous Metals Research Association has made arrangements for communicating the results of its research investigations to its members. Lectures are arranged at one or more centres to which as a rule only the members of the Association itself are admitted. By this means early confidential communication of the results of the research is assured to those who have given it financial support, and the investigator gets into close and immediate contact with that section of the industry chiefly interested in his work. The Non-Ferrous Metals Research Association is at present engaged on some ten investigations, all of which are closely connected with different branches of the metals and engineering trades.

So far the lecture system has been applied to two subjects. Dr. W. Rosenhain, F.R.S., has reported on the investigation on copper, and the influence upon its properties of small quantities of impurities, which is being carried out for the Association by Dr. D. Hanson and others at the National Physical Laboratory. This research promises to be of fundamental importance to the copper and brass industry, and most of the leading firms are supporting the work and eagerly take advantage of opportunities, such as this lecture afforded, of hearing the results achieved.

There was another large attendance of members at the lecture on "The cause and prevention of Red Stains on Brass," by Mr. E. A. Bolton, M.Sc., describing work on this problem which he is carrying out at the Birmingham University.

### The Royal Society

AMONG the papers to be read at a meeting of the Royal Society on March 8 at 4.30 p.m. are: "Determination of Velocity of Explosion Waves in Sea Water: Variation of Velocity with Temperature," by A. B. Wood, H. E. Brown and C. Cochrane, communicated by F. E. Smith, F.R.S.; "The Study of Forked Alpha Ray Tracks," by P. M. S. Blackett, communicated by Sir Ernest Rutherford, F.R.S.; "Metal Sols in Non-Dissociating Liquids—I: Nickel in Toluene and Benzene," by E. Hatschek and P. C. L. Thorne, communicated by Professor A. W. Porter, F.R.S. The papers to be read in title only include: "Constitution of the X-Ray Spectra belonging to the L Series of the Elements," by H. Hirata, communicated by Sir William Bragg, F.R.S.; "On the Vapour Pressure of Lead," by A. Egerton, communicated by Professor F. A. Lindemann, F.R.S.; "Some Density Determinations," by A. C. Egerton and W. B. Lee, communicated by Professor F. A. Lindemann, F.R.S.; and "Separation of Isotopes of Zinc," by A. C. Egerton and W. B. Lee, communicated by Professor F. A. Lindemann, F.R.S.

### Properties of Stainless Steel

At a meeting of the Birmingham Metallurgical Society, on Thursday, February 22, Mr. J. H. G. Monypenny, of Sheffield, in a paper on "Stainless Steel," said the general properties of stainless steel and its resistance to corrosion were influenced to a considerable extent by the heat treatment which the steel had undergone. The influence of varying composition, more particularly of carbon content, was dealt with, and it was emphasised that there were available a whole range of steels, all possessing the property of resistance to corrosion but differing from each other as mild steel does from file steel. A short account was given of some of the purposes to which stainless steel has been applied, where the resistance to corrosion and also to erosion by rapidly moving liquids or gases had effected considerable economies in working. Among the examples quoted were rams for hydraulic pumps, hydraulic and steam stop valves, steam trap valves, boiler feed check valves, etc.

### The Agricultural Chemist

THE Institute of Chemistry recently received an official communication from the Ministry of Agriculture and Fisheries in connection with their protest that analytical work carried out at reduced rates by the Ministry was detrimental to the interests of the private chemist. This point was conceded, and a circular was dispatched to the Agricultural Colleges under the Ministry that careful watch should be kept over analyses to ensure that these were conducted only for strictly educational purposes or as a necessary part of the College's advisory work.

### Electrical Trades Directory and Handbook

THE publication of the forty-first edition of the *Electrician Directory* has been slightly delayed owing to labour troubles, but copies are now available at the offices of the publishers, Benn Brothers, Ltd., at the price of 25s. net. It is the proud boast of those who produce this book that it is the one publication to which reference with regard to those working in the electrical industry can be made with absolute confidence and accuracy. To justify this boast, thorough revision is essential, and a careful lookout has to be kept for additions which become necessary from time to time. A cursory examination shows that in the current edition this work has been done as well as usual, and we have no doubt that this opinion will be confirmed as the book is constantly used during the coming twelve months. This policy of revision applies equally to the Handbook Section, and in the case of this particular edition the electro-technical tables, commercial information and statistics, the legal digest, and the departmental regulations have all been carefully checked and corrected. In view of the numerous tariff changes during the year, the matter relating to the import duties leviable on electrical machinery and apparatus in the British Dominions and foreign countries has been re-written and several new items have been included.

An electrical directory without any reference to broadcasting, and especially the regulations which hedge it round, would, indeed, be incomplete. We are not, therefore, surprised to find that these regulations are included in the *Directory*, or that important legislation relating to another sphere of electrical activities in an abstract of the Electricity Supply Act of 1922 and in particulars of the reorganisation of electricity supply are also to be found.

### Affairs of a Colour and Chemical Merchant

IN the bankruptcy of Louis Jules Fort (described in the receiving order as F. Ford and Co.), oil and colour and chemical merchant, Bush Lane House, London, the Official Receiver has issued to the creditors a summary of the debtor's statement of affairs, which shows liabilities £16,682, of which £15,562 are returned as expected to rank, and assets five bad book debts, £4,266, estimated to realise nothing. A sitting for the public examination of the debtor was appointed at the London Bankruptcy Court on February 21, but he failed to appear and the Official Receiver said that the case had stood over from November 22 last, when he also failed to attend. He had failed likewise to keep appointments made by the Official Receiver, and the summary had been issued to the creditors without his having been examined on his statement of affairs privately. A letter had just been received from him from Paris and he stated in it that it was quite impossible for him to leave for London for his public examination, being stranded in Paris. In consequence of bad trade he had lost a situation there and was now penniless with a family to support. The Official Receiver said that it seemed to him that the debtor did not intend to return to this country, and consequently it was now his duty to apply to the Court for an adjournment of the examination *sine die*. This application Mr. Registrar Hope granted.

### Safeguarding Act Exemptions

UNDER the Finance Act, 1922, the Treasury has exempted from the duty imposed by Part I. of the Safeguarding of Industries Act such articles mentioned in the following schedule as not entered under the Customs Act before February 26 were Toilet oils ready for use as such, and dutiable only by reason of containing dutiable perfumes as ingredients, provided that such oils are unmedicated. The goods following, if they are dutiable only by reason of containing dutiable chemicals as a part of ingredient, i.e., (a) fireworks, including aluminium torches; (b) sporting cartridges; (c) bath salts ready for use as such; (d) grease paints ready for use as such; (e) such toilet soaps, toilet creams, toilet powders, toilet depilatories, tooth pastes, and tooth powders, unmedicated, and ready for use as such. Toilet and medicinal preparations and disinfectants and flavouring mixtures which are dutiable only by reason of containing as ingredients dutiable chemicals, provided that the value of such dutiable ingredients does not exceed 10 per cent. of the aggregate of the values of all the ingredients of that article.



## Formaldehyde and the Nitronaphthalenes

### Interesting Papers at Birmingham

At a meeting of the Birmingham and Midland Section of the Society of Chemical Industry, held at the University of Birmingham on February 20, Dr. E. B. Maxted presiding, a paper on the "Interaction of Formaldehyde and the Nitronaphthylamines," by Professor G. T. Morgan and F. R. Jones, and a note on "The Preparation of  $\beta$ -naphthol-4-sulphonic Acid," by Professor Morgan and E. Jones, were read.

In the first paper the authors stated that the seven known nitronaphthylamines have been condensed with formaldehyde under varying conditions: 4-nitro- $\alpha$ -naphthylamine and 2-nitro- $\alpha$ -naphthylamine give dinaphthylmethane bases; 1-nitro- $\beta$ -naphthylamine furnishes the hydrolysable methylenebis-1-nitro- $\beta$ -naphthylamine, which exists in two differently coloured modifications; 5-nitro- $\beta$ -naphthylamine gives rise to two products, a dinaphthylmethane base and a dinaphthacridine; 8-nitro- $\beta$ -naphthylamine gives methylenebis-8-nitro- $\beta$ -naphthylamine, which becomes transformed into a dinaphthylmethane base; 5-nitro- $\alpha$ -naphthylamine resembles  $\alpha$ -naphthylamine in yielding ill-defined products, whereas 8-nitro- $\alpha$ -naphthylamine furnishes methylenebis-8-nitro- $\alpha$ -naphthylamine and a dinaphthylmethane base, which has the noteworthy property of separating in yellowish-white tabular crystals containing three molecular proportions of formaldehyde. These results show that the nearer the nitro-group is to the amino-radicle in the nitronaphthylamine the more marked is the retarding effect of this nitro-group on the condensation with formaldehyde.

The authors explained that in the second contribution an attempt had been made to obtain  $\beta$ -naphthol-4-sulphonic acid from the commercially available naphthalene-1-diazo-2-oxide-4-sulphonic acid by boiling this diazo-compound with alcohol, when elimination of the diazo-group occurred, the resulting  $\beta$ -naphthol-sulphonic acid being characterised by means of its azo-derivatives with the diazonium salts of *p*-toluidine, *p*-nitroaniline and  $\beta$ -naphthylamine.

### Metal Polishing and Grinding

A LECTURE was given on Monday, February 26, at the Chamber of Commerce, Birmingham, by Mr. Dartrey Lewis, M.Met., describing an investigation on the materials used in metal polishing which he has undertaken for the British Non-Ferrous Metals Research Association, and carried out at the Sheffield University, under the supervision of Professor Desch, F.R.S. In introducing the lecturer, Dr. R. S. Hutton, director of the British Non-Ferrous Metals Research Association, explained that the lecture would describe the first-fruits of one of a series of researches undertaken by this Association on problems of direct practical importance to the metal industries.

Mr. Dartrey Lewis explained that he had devoted his attention to investigating the fundamental properties of the materials used in metal polishing—sand, pumice, emery, etc. Methods had been devised for measuring the abrading or cutting power of these materials on brass and other metals in the loose powdered form in which they are generally used. The relative durability of the materials, or the useful life of their grains before they broke down into too fine a state of division to effect any more useful grinding, had also been measured. Though the experts in the trade possessed a vast amount of accumulated experience, the necessity for quantitative comparative measurements was great, because in recent years new abrasive materials, such as artificial corundum and carborundum, had been discovered, of much better grinding power and of greater durability. It was suggested that advantage might be taken of some of the superior materials to remove the rougher and thicker layers of metal, whilst still using sand and pumice for smoothing off preparatory to the real polishing. He also briefly described his experiments in comparing chromic oxide and rouge for polishing steel and silver.

The British Non-Ferrous Metals Research Association is extending the investigation to "glazing" and other abrasive processes in which the abrasives are fixed to wheels by glue.

## Communism Analysed and Exposed

SIR ERNEST BENN and Mr. J. T. Walton Newbold, M.P., were the protagonists in a debate arranged by the Industrial League and Council on Thursday, February 22. The subject was "that Communism would be a danger to the good of the people," Sir Ernest Benn upholding this view and Mr. Newbold opposing. The debate took place at the Kingsway Hall, London, and the tickets were distributed equally by the Communist Party, and the Industrial League and Council. There was a large audience. Arrangements were also made to broadcast the debate by wireless. Lord Askwith, who took the chair, explained that each of the protagonists would speak three times, for alternate periods of thirty, fifteen, and five minutes.

Sir Ernest Benn, who had evidently made an exhaustive study of Communist principles and practices, and handled the subject in a cool analytical spirit, brought a stream of facts to bear on the discussion, and Mr. Newbold was driven to a confession which at the same time did him credit and exposed his case. He swept aside the Russian constitution, he declined to deal with the problems of the representation of the people, and boldly admitted that Communism as practised in Russia was undiluted despotism, a dictatorship on the part of one man. So the debate ended with a clear statement of the position. Communism consists in the determination of a handful of persons banded together in the Third International to force their views upon the world. Communism was thus boiled down to the purest form of individualism—half a dozen strong wills, guided by the still stronger will of Lenin, in absolute control of the great Russian Empire and hoping to secure a still wider power. The whole debate seemed to lead up to one moral—if only those blessed with constructive tendencies had half the energy, half the will-power, half the pluck, or half the cheek of the advocates of destruction, how fast the world would go ahead!

### Chemicals and Cartage Charges

IN the City of London Court, on Thursday, February 22, before Judge Shewell Cooper, Mr. Morris Michaels, cartage contractor, 74, Brushfield Street, Spitalfields, sued the Vulcan International Transport Co., 58, Upper Thames Street, for £10 5s. cartage.

Mr. H. Strouts, who appeared for the plaintiff, said that defendants admitted owing £7 3s. 11d., but they disputed the balance on the ground that the prices were not in accordance with the usual customs of the cartage trade, and that the weights were incorrect.

Arthur Beachey, motor lorry driver to the plaintiff, said that in November one of the defendants' representatives in Birmingham asked him to convey a parcel of chemicals for the County Chemical Co., of Birmingham, to London. He picked up 11 packages and the terms were 33s. per ton. The weight was between 8 cwt. and 9 cwt. He told the defendants' representative that he must regard it as one ton and that was agreed upon. That was a practice in the cartage trade in making arrangements. He took another consignment of goods weighing 3½ tons and he said he could not accept that unless he was paid for 4 tons. The defendants' representative agreed. They were very anxious that he should get into London from Birmingham the next day as they wanted to catch a particular boat. He said he would do his best to get there as soon as possible, but it was foggy, and he would not travel through the night.—In cross-examination the witness said that he did not guarantee to get the goods into London the next day, but he simply said he would do his utmost.

Mr. Barnett Michaels, the plaintiff's manager, said he agreed to do one job for £1, but in the end it ran into two days instead of one day; therefore he charged £2.

Sculley, the defendants' manager, said that his men had no authority to agree to weights larger than they were.

The Judge suggested that it was customary to charge for a round ton when only 8 cwt. or 9 cwt. was carried.

Sculley said that it was impossible, and that it would be better to send the goods by rail than by road transport if people were going to charge a ton when they only carried 8 cwt.

The Judge found in favour of the plaintiff and gave judgment for the amount claimed, with costs.

## Hydrates of Calcium Sulphate

### Comparison of Dehydration Methods

A PAPER ON "Plaster of Paris," by Messrs. Brittain and Elliott, was read before the Nottingham Section of the Society of Chemical Industry on February 22. After a brief survey of previous work, and particular reference to the paper by Davis (*J. Soc. Chem. Ind.* 26, 727 (1907)), the authors described their own results on the dehydration temperatures, vapour pressures and solubilities of the various hydrates of calcium sulphate and anhydrites. The first loss of water of the dehydrate occurred at 100° to 130°, giving the half hydrate, which in its turn was dehydrated between 160° and 200°. After prolonged heating between 200° and 300° the plaster would not set with water unless it was very finely ground, when this property was recovered to some extent.

The process of dehydration in kettles as practised in America was then described and illustrated by slides. The mass was heated by means of flue pipes through which passed the heating gases. At about 120° to 130° the gypsum boiled and was easily stirred. It then settled down and if further heated boiled again at 190°. The losses of water were 15 per cent. and 6 per cent. respectively. The steam carried off great quantities of dust, which were caught in a box. In the continuous rotary process of Cummer the furnace gases passed directly through the material which was contained in a cylinder which was rotated round an axis inclined at a small angle to the horizontal. It then passed into calcining bins, and finally was ground for use.

In the English process the material was heated in open pans 16 ft. to 22 ft. in diameter, by flue gases which passed underneath. The boiling mass was stirred by chains. The fuel consumption of this process was excessive and much was lost in the form of dust. Improvements were suggested by the lecturer.

If prepared below 150° the product consisted mainly of soluble anhydrite and the hemihydrate. All plaster contained undecomposed gypsum, and small quantities of this accelerated the setting, especially if the plaster was ground very fine. If, however, larger proportions of gypsum, up to 15 per cent. and over, were present the strength of the set plaster was seriously diminished, and a like effect was produced by similar proportions of dead burnt anhydrite, which also took no part in the crystallisation or setting. The effect of accelerators was briefly considered and explanations of their action put forward.

### The New Elements

THE discovery of hafnium, by Messrs. Coster and Hevesy at Copenhagen, is attracting some interest in the public press, and considerable obscurity appears to surround the matter at present. The discoverers, writing in *Nature* last week, claim that the element probably exists in the earth's crust in the proportion of more than one part in 100,000. They base their estimate on its abundant presence in zirconium minerals.

They report, moreover, that Professor V. Goldschmidt has found a mineral of which hafnium is the main metallic constituent, and that they have confirmed this by X-ray investigation of samples sent to them—a process which failed to give the desired result in the case of Professor Alexander Scott's samples. Sir Edward Thorpe, on the other hand, also writing to *Nature*, suggests that the black New Zealand sands from which Professor Scott isolated his substance are similar in character to Cornish sands, in which was first detected the existence of the element now known as titanium. He recalls that the atomic weight of titanium was long uncertain, and suggests that the different results obtained were due to the presence of varying quantities of an element of higher atomic weight—possibly hafnium.

Meantime, hafnium remains unisolated if the negative results of Coster and Hevesy on Dr. Scott's substance are confirmed by other workers. MM. Urbain and Dauvillier still maintain that number 72 in the atomic table is filled by the element which they named celtium. Coster and Hevesy submit that celtium cannot be reconciled with modern atomic theory, as it is a rare earth element. The question remains open, and further developments may be interesting. The possible commercial value of the new element (or elements) remains problematical, as the related elements are not of great value.

## Chemical Merchants' Failure

A MEETING of creditors interested in the voluntary liquidation of J. D. Bishop and Co., Ltd., drug and chemical merchants, 22/23, Great Tower Street, London, E.C., was held on Friday, February 23, in London. The chair was occupied by Mr. F. J. Braybrooks, who had been appointed to act as liquidator. An approximate statement of affairs showed liabilities of £3,732 5s. 11d., all of which was due to unsecured creditors, but there were fully secured creditors for £688 14s. 10d., who held liens on stocks. The assets were estimated to realise £2,212 7s. 1d., from which had to be deducted £61 8s. for preferential claims and £688 14s. 10d. due to the fully secured creditors. The net assets were £1,462 4s. 3d., or a deficiency as regards the unsecured creditors of £2,270 1s. 8d.

The liquidator stated that the present position of the company was due to failure on the part of manufacturers to make deliveries in accordance with contracts. As a result the company had had to buy at higher prices and lose a large proportion of their profits. The company had also been affected by the rate of exchange.

A creditor inquired if there was any value attached to the goodwill and the name of J. D. Bishop and Co., Ltd. He understood that Mr. J. D. Bishop had now commenced trading in his own name.

Mr. Braybrooks replied that before the company was formed the business was carried on under the style of J. D. Bishop and Co., and since the company had gone into liquidation the directors had started another business. The directors consulted him before they commenced to trade on their own account. He did not think there was any value in the goodwill.

A creditor said it appeared that J. D. Bishop and Co., Ltd., was being wiped out, but J. D. Bishop and Co. was being left to trade.

In answer to further questions the liquidator stated that the directors were creditors for a substantial amount. The unsecured liabilities included a claim for a breach of contract to the extent of £1,120. That claim represented a drop in the price of tartaric acid of 2s. 6d. per lb. The company purchased at 3s. 9d. and the market fell to 1s. 3d. and the company appeared to be liable for the balance. Originally the company dealt largely with India in tartaric acid, but when the Indian crisis arose that outlet was closed.

A representative of Stafford Allen and Co. stated that on December 16 last they were pressed to expedite the delivery of goods and they supplied the company with articles to the value of £240 towards the end of December. He complained that when they were pressed to deliver the goods the directors must have known what the position of the company was.

Mr. J. D. Bishop replied that it was not until the end of December that they realised that the position was acute.

It was decided that the voluntary liquidation of the company should be continued with Mr. Braybrooks as liquidator, together with an informal committee consisting of the representatives of Stafford Allen and Sons, Ltd., Johnson and Jorgensen, Ltd., and the John Dale Manufacturing Co.

### An American Institute of Chemistry

THE American Institute of Chemistry has been inaugurated in New York to forward the interests of the younger chemist. It does not intend to encroach upon the activities of the already-established societies, nor does it intend to enter the field of publication, but its papers will seek publication in present journals. The purposes of the body, as stated in the constitution, also include the promotion of a popular appreciation of chemical research and control in industry. Though it is stated that the society will follow in a general way the model of the British Institute of Chemistry, the scope would appear to be somewhat different.

### New Prices for Methylated Spirit and Finish

A CIRCULAR issued by the Methylating Co., Ltd., states that as from March 1 their prices for industrial methylated spirit are as follows for the 61 and 64 o.p. qualities respectively: 2s. 4d. and 2s. 5d. for 10 gallons and under 30 gallons; 2s. 2d. and 2s. 3d. for 30 gallons and under 100; and 2s. and 2s. 1d. for 100 gallons and upwards. Methylated resin finish and methylated shellac finish will be 2d. and 8d. per gallon respectively over the prices quoted for industrial methylated spirit.



## Chemical Matters in Parliament

### Dangerous Drugs Bill

LIEUT.-COLONEL L. WILSON (House of Commons, February 28) formally moved the second reading of the Dangerous Drugs and Poisons (Amendment) Bill, which was agreed to without a division.

### Import of Dyestuffs

Major Attlee (House of Commons, February 26) asked the President of the Board of Trade whether he was aware that Messrs. Thomas H. Daniels and Co., of Belfast, were charged 2s. 6d. import licence under the Dyestuffs Act, 1920, on 120 lb. diamine rose B extra at 14s. 6d. per lb., but 10s. on 240 lb. of the same dye at the same price; and whether these charges were in accordance with the sliding scale.

Sir W. Joynson-Hicks replied that the answer to both parts of the question was in the affirmative.

### Payment for Imported Dyes

Mr. Pringle (House of Commons, February 27) asked the President of the Board of Trade whether his attention had been called to the recent failure of K. H. Kabbur and Co., Manchester; whether the Central Importing Agency of the Board of Trade were creditors to the extent of £50,992 for dyestuffs; whether he was aware that it was a rule of the Board of Trade that no dyestuffs should be delivered by the Central Importing Agency until cash had been first received; and whether he could explain why this rule, which had been strictly enforced in transactions with the largest buyers in Great Britain, had been relaxed in this case.

Sir P. Lloyd-Greame said the question appeared to be based on a misapprehension. The creditors of Messrs. Kabbur and Co. for the sum mentioned were Messrs. Fairclough, Dodd and Jones, the principals of the Central Importing Agency, and not the Board of Trade, who were not in any way concerned in the transactions to which the debt related. The remainder of the question consequently did not arise.

### Distribution of Reparation Dyes

Replying to Mr. Hope Simpson (House of Commons, February 27), Sir P. Lloyd-Greame said that no reparation dyestuffs other than indigo were being sold to any firms for re-sale in this country apart from the general scheme of distribution conducted by the reparation department of the British Dyestuffs Corporation, Ltd.

In reply to a further question relating to several hundred tons of German indigo, 20 per cent., sent to this country as reparations, Sir P. Lloyd-Greame said that this supply of indigo was requisitioned from Germany in pursuance of an arrangement between the principal consumers of indigo in this country and the British Dyestuffs Corporation, who were the only British manufacturers of that product. The quantities received were sold to the Corporation at the prices credited to Germany (which varied with each consignment) plus expenses of importation. Under the terms of the arrangement the British Dyestuffs Corporation were delivering against all United Kingdom orders for synthetic indigo, two-thirds British make and one-third German make, at an equalised price. It was not the policy of the Government to encourage the Corporation to devote its energies to the merchandising of German dyes.

### Waterproofing Cement

SOME interesting tests on "Kynazite," a preparation for waterproofing cement and mortar, have been carried out by Mr. F. E. Drury at the College of Technology, Manchester. This substance, which is produced by the Kynaz Products Co., Ceinws, Montgomeryshire, is used to replace a proportion of the sand used in manufacture. The results show definitely that Kynazite is an effective waterproofer of mortar and cement in all cases, even for water under pressure, the imperviousness being increased by increasing the proportion of the product. The strength of the materials as determined by compression tests was found to be slightly greater than ordinary cement and mortar. Concrete made with Kynazite replacing the whole of the sand content was found to be highly water resisting, but in this case the strength was only about 50 per cent. of that of plain concrete.

## Europe's New Economic Centre

WHEN the *European Commercial* was established some months ago, Vienna was chosen as its publishing headquarters in the belief that the process of European recovery would begin in Austria and gradually spread outwards. It was an act of faith and foresight which needed courage at the moment but which already is being vindicated by the course of events. Just as it used to be said that what Manchester thinks to-day England thinks to-morrow, so it may be said now that what the publishers of the *European Commercial* saw six months ago, Europe—and the more far-sighted minds of America—sees with ever-increasing clearness to-day. Austria, in a word, is to be the economic rallying point for Europe.

The most solid piece of evidence that could be desired on this point is the invitation this week by the Bank of England "at the request of the League of Nations, and of His Majesty's Government," for subscriptions to an issue of £1,800,000 of Austrian Government Guaranteed Treasury Bills. This sum represents Great Britain's portion of a total of £3,500,000 which is being raised this week in six European countries to meet Austria's more immediate financial needs. Arrangements have been, or are in course of being, made for similar issues in various continental countries—namely, £800,000 in France, £500,000 in Holland, £100,000 in Belgium, £200,000 in Switzerland, and £100,000 in Sweden. These amounts, together with the British issue, will make a total of £3,500,000, which is the amount of temporary accommodation that Austria needs, pending the flotation of a long-term loan of 650 million gold kronen (£27,000,000) as provided for in the League of Nations scheme for the rehabilitation of Austria. Not the least impressive feature of this plan is that the central banks of six European countries are co-operating in securing its success—the first occasion in history on which such institutions have joined in a collective effort. Nor are the participating nations limited to allies or belligerents. They include several neutrals, who, viewing the situation more calmly, see European salvation to be dependent on the re-establishment of international credit and commerce.

With such a spectacle before us, nothing could be more tragic than that, while the far-sighted minds of Europe are fixed on the new future, our own leaders of industry should be blind to the high duties and the great opportunities awaiting them. The great fortune-makers of the world have won their successes by seeing a fraction of a stage ahead of their fellows, and those who share in the glory and the reward of rebuilding Europe will be those who march in front. Our manufacturers need a touch of the spirit of those merchant adventurers who won our markets in every quarter of the world. Europe, which needs our money to-day, will need our goods to-morrow; is needing them, indeed, even now. The crying need is for the British manufacturer to get busy in Europe, with Vienna as his centre. Years hence it will be the satisfaction of the publishers of the *European Commercial* to have pointed the way to success, still more to have helped the British trader to secure his share in it.

### Commercial Gas Co's Recreation Club

THE third annual dinner of the Commercial Gas Co.'s Recreation Club was held at Pinoli's Restaurant, London, on Friday evening, February 23. Mr. Alwyne Meade, A.M.Inst.C.E., presided, and there was a very large attendance. The principal toasts were "The Club," proposed by Mr. E. Copeman and responded to by Mr. W. Fisher (hon. treasurer), and "The Visitors," proposed by the Chairman and responded to by Mr. F. E. Hamer (editor of THE CHEMICAL AGE). Reference was made in the course of the speeches to the men's interest in the club as a social centre and to its excellent effect in promoting a good understanding throughout the entire staff. The Chairman, in acknowledging the toast of his health, referred to the loyal support of all engaged in the works and to the co-operative spirit in which all worked together for the good of the undertaking. During the evening an interesting musical programme was carried through, and the following club prizes in the billiard competitions were distributed:—Departmental team contests (20 teams): Messrs. Long (captain), J. Lister, J. A. Baker and Konrath; all-level competition: Mr. C. J. Gill (for the second year); works handicap, 1, Mr. C. J. Gill; 2, Mr. W. Fisher.



## From Week to Week

MR. R. C. JOHNSON, of Oxford and London Universities, has been appointed lecturer in Physics at Queen's University, Belfast.

SIR ALFRED MOND was appointed a director of the South Staffordshire Mond Gas Co., Ltd., at a meeting held on February 27.

AT EDINBURGH on Monday, February 26, Dr. W. Hope Fowler gave the first of four lectures to the Royal Scottish Society of Arts on X-rays.

THE ROYAL SOCIETY has appointed a committee to consider the question of the administration of Sir Alfred Yarrow's gift of £100,000 for scientific research.

ARTIFICIAL SILK has been in increasing demand during the past year, but the viscose company (Courtaulds, Ltd.) do not consider these conditions likely to be lasting.

IT IS REPORTED that a big scheme of power development in the Transvaal is under consideration, to include the manufacture of chemical by-products from ground coal in a factory at Kosi Bay.

PROFESSOR NIELS BOHR, of Copenhagen, declared on Wednesday that he had finished testing the material sent for examination by Dr. Alexander Scott, and found that it contained mainly decanium and iron, but no hafnium.

THE PORT OF LONDON AUTHORITY are reported to be contemplating taking over Colehaven and Thameshaven, and it is stated that a huge scheme is on foot to develop these oil wharves, involving expenditure of a considerable sum.

THE RUBBER GROWERS' ASSOCIATION announces that it has no knowledge of any report having been sent to the Colonial Office containing suggested modifications of the restriction scheme, thus contradicting officially the rumours current last week.

THE NITRATE OF SODA statistics published monthly by Aikman (London), Ltd., show that there has been a great reduction during February in the world's stocks, which are now 750,000 tons less than at the same date last year and only about 160,000 tons larger than pre-war.

IT IS REPORTED from Paris that Professor Kling, of the Municipal Chemical Laboratory, believes that we are on the eve of important developments in coal-tar products, and that it will soon be practicable, by means of a hydrogenation process, to produce light and heavy motor oils, etc.

THE RAILWAY RATES TRIBUNAL met on Wednesday to consider provisional proposals for revision of goods train traffic rates, and the opinions of various bodies and persons in respect of minimum distances, mileage gradations, forms of schedules, and methods of calculating charges.

SIR R. T. GLAZEBROOK has pointed out, in view of Sir Alfred Yarrow's recent gift to the Royal Society, that this is not the first time science has benefited from the same source, as Sir Alfred has rendered valuable assistance in the past towards equipping the National Physical Laboratory.

FROM VALPARAISO it is reported that exports of nitrate from Chile during the week to February 22 amounted to 67,300 tons, against 39,300 tons and 16,500 tons for the two preceding weeks respectively. The average weekly exports during the last nine months have been approximately 42,000 tons.

GERMAN EXPORTS of chemicals in 1913 amounted to 2,530,000 tons; in 1920 they were only 510,000 tons, 690,000 in 1921, and 890,000 tons in 1922. The values expressed in gold marks show a still greater decrease, being 910 millions in 1913, 470 millions in 1920, 330 millions in 1921, and only 290 million gold marks in 1922.

A DEPUTATION of technical experts from the Federation of British Industries, on Wednesday discussed with Lord Onslow the question of local legislation dealing with smoke abatement. The deputation were given to understand that the Government were contemplating the early introduction of public and national legislation dealing with the subject.

AT LEEDS UNIVERSITY, on Wednesday, February 21, a reception was given by the chairman of the Textile Industries and Dyeing Committee, Mr. Joseph Lowden. The guests inspected the work of the departments of textile industries, colour chemistry, and dyeing. Among those present were Professor Arthur Smithells and Professor A. G. Perkin.

THE SENATE of Queen's University, Belfast, at its last meeting approved certain regulations respecting the Musgrave Research Studentships, which are of annual value of £200, and are granted for research in chemistry, biology, etc. The Buildings Committee was requested to obtain approximate plans and costs for a new chemistry building, and to report to the Senate.

AT A MEETING of representatives of the Federation of Master Cotton Spinners' Associations and of the Allied Associations of Bleachers, Dyers, and Finishers in the cotton trade in Manchester, on February 23, attention was drawn to the fact that Lancashire goods had recently been sent to Belgium to be dyed, and had been brought back to England for a considerably less amount than British dyers are now charging for the same work.

FROM THE JOURNAL of the Institute of Chemistry we learn that the scheme of examinations for the award of National Certificates in Chemistry is progressing favourably, although somewhat unsatisfactory conditions still exist in some institutions adopting the scheme. The scheme will undoubtedly assist the progress of chemistry in inspecting the work in the colleges under the scheme. The number of institutions participating has increased considerably.

THE LONDON COUNTY COUNCIL is prepared to consider applications from British subjects—provided their parents or guardians live in the County of London—for free places at the Imperial College of Science and Technology for candidates at least eighteen years of age desirous of taking a post-graduate course in chemistry, engineering, etc. Detailed particulars may be obtained from the Education Officer (Technology Branch), at the County Hall, Westminster Bridge, London.

AMONG the papers to be read at a meeting of the Royal Society at Burlington House, London, on March 1, at 4.30 p.m., are:—"The Effect of Temperature on some of the Properties of Steel," by A. Mallock, F.R.S.; and "Studies of Iridescent Colour, and the Structure Producing it: I.—The Colours of Potassium Chlorate Crystals; II.—Mother of Pearl; III.—The Colours of Labrador Felspar," by Lord Rayleigh, F.R.S. A paper by Dr. L. V. King, and communicated by Professor A. S. Eve, F.R.S., on "The Complex Anisotropic Molecules in Relation to the Dispersion and Scattering of Light" will be read in title only.

THE BRITISH SCIENCE GUILD organised a meeting at the Mansion House last Tuesday to promote the application of scientific method in industry, commerce and public affairs. The Lord Mayor presided, and letters were read from Sir Alfred Yarrow and Sir J. J. Thomson, who were unable to be present. The latter pointed out that in spite of the efforts so far made, the value of scientific research had not yet been brought before the mass of the people. Sir Ronald Ross appealed for the encouragement of the "problem solver." Others among those present were Lord Bledisloe, Lord Avebury, Dr Myers and Dr. R. M. Walmisley.

DEALING with the increased prices in the Ruhr either directly or indirectly due to the French occupation, a correspondent of the *Manchester Guardian Commercial* expresses the opinion that the prices of sulphate of ammonia, tar, and benzol will undoubtedly be subjected to considerable increases in the near future. The effect of the occupation, he states, is seen very clearly in the export prices. In the fortnight from January 11 to 25 they were more than doubled owing to the increase in the cost of production. Caustic potash rose from 1,050 to 2,400 marks per kilogram, caustic soda from 825 to 1,700, oxalic acid from 2,100 to 4,400, etc. Further large increases are to be expected.

THE COMMERCIAL SECRETARY at Buenos Aires reports that a local firm is desirous of getting into touch with United Kingdom manufacturers of machinery for all classes of pharmaceutical industries in general; machinery for removing grease, cleaning and carding cotton fibre; complete machinery for the manufacture of oxygen water; complete machinery for the manufacture of soaps; complete machinery for the manufacture of glass bottles; complete machinery for the manufacture of sulphuric ether; complete machinery for the manufacture of caustic soda; complete machinery for the manufacture of ice. The name and address of the firm can be obtained by United Kingdom firms on application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1.

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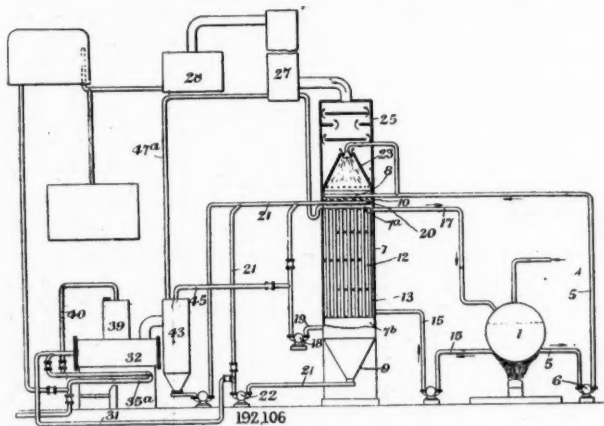
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### Abstracts of Complete Specifications

192,106. ALUMINIUM CHLORIDE USED IN THE CONVERSION OF HIGH BOILING POINT HYDROCARBONS INTO LOW BOILING POINT HYDROCARBONS, PROCESS OF RECOVERING. E. C. R. Marks, London. From the Hoover Co., 230, East Ohio Street, Chicago, Ill., U.S.A. Application date, August 22, 1921.

The mixture of aluminium chloride and hydrocarbon used as a catalysing agent in the cracking of high boiling point hydrocarbons is sprayed into a vaporising chamber at a temperature above the vaporising point of aluminium chloride. The aluminium chloride and hydrocarbon vapour are condensed and returned to the oil-refining apparatus. Crude oil is supplied to a preheater 1, and is then forced by a pump 6 through a pipe 5 to a sprayer 8 at the top of a contact chamber 7, the level being maintained at the line 10. The upper and lower chambers 7a, 7b of the contact chamber are connected by tubes 12 for the circulation of the oil, and the temperature of the latter is maintained by passing the hot oil from the preheater through a pipe 15 to the space 13 surrounding the tubes, and back to the preheater through the pipe 17. The mixture of aluminium chloride and hydrocarbon is circulated through the chamber 17 and pipe 19 by the pump 18, which returns the mixture to a sprayer 20. The aluminium chloride which tends to settle in the conical bottom 9 is kept in circulation through a pipe 21, by a pump 22, which returns it to the chamber 7a. Light hydrocarbon vapour and some aluminium chloride are subjected to a spray of heavy oil in the space 23, which washes back the aluminium chloride and any heavy hydrocarbons, while a further condensation takes place in the baffle chamber 25.



The light hydrocarbon vapour then passes to a reflux tower 27 for further separation, and thence to a condenser 28. To recover the aluminium chloride, the sludge is withdrawn periodically from the space 9 through the pipes 21, 31 to a vaporising chamber 32. It is found that a better recovery of aluminium chloride is obtained if the sludge is withdrawn when the total asphaltic and free carbon constituents do not exceed 25 per cent. The chamber 32 is maintained at 400° F. by means of a furnace, and the sludge is preferably preheated before discharging into this chamber by means of hot gas which is injected into it after passing through a pipe 35<sup>a</sup> in the furnace. This gas may be inert gas, or hydrochloric acid or chlorine, and in the latter case the gas may be passed through a pipe 40 to a chamber 39 containing metallic aluminium, so that fresh aluminium chloride is produced to replace losses. The rapid expansion in the chamber 32 facilitates the release of aluminium chloride, which then passes into a chamber 43, where it is condensed with oil supplied from the circulating system through the pipe 45. Any light vapour is not condensed but passes through a pipe 47<sup>a</sup> to the reflux tower 27. A modified apparatus is also described in which the distillate from the chamber 32 is returned direct to the chamber 7, where those portions which are below the gasoline gravity are condensed and returned to the system. In this apparatus the

contact chamber 7 is not heated by the circulation of hot oil from the preheater 1, but the temperature is maintained by the frequent passage of the oil through one or more vaporising chambers such as 32.

192,107. PLASTIC OR THERMO-PLASTIC MATERIALS, MANUFACTURE OF. Columbia Graphophone Co., Ltd., 102-108, Clerkenwell Road, London, E.C.1, W. T. Forse, F. W. Jones, jun., and G. Walters, Bendon Valley, Garratt Lane, London, S.W.18. Application date, August 24, 1921.

The process is for the manufacture of a material from a cellulose ester, a gelatinising agent and a filling material, which is capable of being moulded under heat and/or pressure. The basic material is composed of nitro-cellulose of low nitrogen content, known as collodion cotton, and a non-volatile gelatiniser. The latter may be a nitro-hydrocarbon such as dinitrotoluene, a urethane such as phenol-urethane, a substituted urea such as diethyl-diphenyl urea, or an anilide or a homologue such as form-*o*-toluidide. This basic material is mixed with one or more of the resins known as acaroid resins or xanthorrhoea resins, and filling materials may also be added such as barium sulphate, carbon black, rotten stone or kieselguhr. In an example, the mixture consists of nitro-cellulose 18.5 per cent., form-*o*-toluidide 14 per cent., acaroid resin 14 per cent., barium sulphate 49 per cent., and lamp black 4.5 per cent. The ingredients are mixed in a mixing machine, or by means of heated rolls, with small quantities of a volatile medium such as amyl acetate, acetone or alcohol. The mixture is raised to 100° C. to remove any excess of solvent, and may then be moulded as desired.

192,108. PLASTIC COMPOSITIONS HAVING A BASIS OF CELLULOSE ESTER. Columbia Graphophone Co., Ltd., 102-108, Clerkenwell Road, London, E.C.1, and W. T. Forse, F. W. Jones, jun., and G. Walters, Bendon Valley, Garratt Lane, London, S.W.18. Application date, August 25, 1921.

This composition for moulding under heat and pressure consists of cellulose acetate, a gelatiniser of cellulose acetate and an acaroid resin. The non-volatile gelatiniser may consist of sulphonamides such as paratoluene sulpho-anilide, compound ureas such as diethyl-diphenyl urea, anilides and their homologues such as form-*o*-toluidide, urethanes such as phenylurethane, esters of oxamic acid such as phenyl-oxamic ester, cyclohexanone and the like. In an example, the mixture may consist of cellulose acetate 2 parts, acaroid resin 1 part, paratoluene-sulpho-anilide 1 part, and carbon black 3 parts.

192,150. FERRO-CHROMIUM ALLOYS, MANUFACTURE OF. W. B. Balantine, 47, Victoria Street, London, S.W.1. Application date, October 25, 1921.

The process is more particularly for the manufacture of low carbon ferro-chrome. A substantially pure oxidised compound of iron and chromium such as chromite, which is free from gangue, is mixed with an equivalent weight of dry calcium silicide containing not more than 0.5 per cent. of carbon. The dry mixture is placed in an electric furnace having a top electrode consisting of carbon, and a bottom electrode consisting of low carbon ferro-chrome. Direct contact between the carbon electrode and the charge is prevented by a layer of broken slag. Reduction of the chromite by the silicide commences at 1,500° C., and the ferro-chrome containing a very low proportion of carbon separates out at the bottom, while a layer of slag consisting of calcium silicate forms on the top. The molten alloy may be further purified by a blowing operation to oxidise the silicon.

192,173. CELLULOSE DERIVATIVES, PRODUCTION OF. Burgess, Ledward and Co., Ltd., Wardley Mills, Walkden, Lancs, and W. Harrison, Beechwood, Walkden Road, Worsley, Lancs. Application date, October 29, 1921.

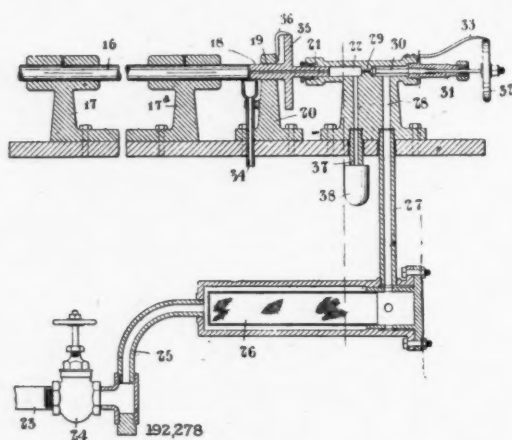
Cellulose fibres such as cotton, linen, hemp or jute, either loose or in the form of yarns or fabrics, are treated with inorganic acid chlorides to obtain derivatives which are not decomposed by water or caustic alkalies. The cellulose is first treated with caustic soda, and then dried rapidly either at a temperature below 40° C., or more rapidly *in vacuo*



up to 50° C. The alkali-containing cellulose is then treated at a temperature below 40° C. with an inorganic acid chloride, which may be thionyl chloride, sulphuryl chloride, pyrosulphuryl chloride, chloresulphonic acid, phosphoryl chloride, and the like. The chloride may be in liquid or in vapour form, but is preferably dissolved in paraffin, petrol, or chlorinated hydrocarbons, and the solvent subsequently removed. The product is washed with water or dilute alkali, and is characterised by an increased affinity for basic dyestuffs. In an example, 100 parts of loose cotton is impregnated with 100-120 parts of 20 per cent. caustic soda, and dried, and the cotton is then worked into a solution of 30-35 parts thionyl chloride in 200 parts paraffin or petrol for five to fifteen minutes. The product is freed from solvent, and the sodium chloride washed out. Other examples are also given. The elasticity of the fibres obtained may be increased by treating with caustic alkali above 6 per cent. strength without the application of tension or pressure, or alternatively by impregnating the cellulose with caustic alkali at or above mercerising strength, and then treating with the inorganic acid chloride without the application of tension.

192,278. HYDRATION OF LIME AND LIKE REACTIONS. N. V. S. Knibbs and the Denny Chemical Engineering Co., Ltd., 810-811, Salisbury House, London, E.C.2. Application date, January 30, 1922.

The apparatus is for effecting continuous reaction between solid and liquid materials, such as lime and water, to produce a product of standard composition. In the case of lime, the hydrated product contains a constant proportion of calcium oxide and water. The reaction chamber comprises two horizontal troughs arranged one above the other, and connected together at one end. The solid material is introduced by a worm conveyor at the top of the uppermost trough, and is conveyed through the trough by means of paddle blades arranged helically on a horizontal rotating shaft extending through the trough. The supply conveyor is connected to a pump which supplies the liquid reacting material, in such a manner that the liquid is delivered in an amount proportional to the amount of the solid material. The quantity of liquid supplied is slightly less than that necessary for the complete



reaction, so that the product contains an excess of the solid material. The liquid is sprayed into the trough near the inlet for the solid material and the sprayer is arranged in a flue which causes a current of air to pass through the trough to remove any vapour generated. An auxiliary supply of liquid is introduced through other sprayers arranged along the trough, and the auxiliary supply is controlled by a temperature-sensitive device. This may comprise two rods of nickel-steel and brass, one of which is secured to the end plate of the upper trough, the other being secured to the end of the other rod, the free end of which passes through a stuffing gland in the end of the trough. This projecting rod is connected to a rod 16, shown in the illustration, which shows the apparatus employed to secure the variation in the auxiliary supply of liquid. The rod 16 slides in bearings 17, 17<sup>a</sup>, and its free end is adjacent

to a perforated spindle 18 screwed into a support 20. The other end of the spindle 18 passes through a gland 21 into a chamber 22, which receives a supply of liquid through a pipe 23, valve 24, pipe 25, filter 26, pipe 27, and needle valve 30. The latter is adjusted by a hand wheel 32 so that the desired quantity of liquid enters the chamber 22 and escapes through the spindle 18. The rate at which liquid escapes is determined by the distance between the end of the rod 16 and the end of the spindle 18, and this distance is determined by the temperature-sensitive device in the reaction trough. The variation in temperature thus produces a corresponding variation in pressure in the chamber 22, which is communicated through a pipe 37 to a diaphragm or other pressure-sensitive device, which controls the supply of liquid in known manner. In the preparation of hydrated lime the temperature at the outlet is preferably maintained between 80° and 100° C., and an excess of water is supplied. Complete hydration is thus secured, and the excess of water is evaporated at the temperature which is maintained.

192,298. PAPAVERINE NITRITE, PROCESS FOR THE PREPARATION OF. Firm of C. H. Boehringer Sohn, and H. Stenzl, Nieder-Jugelheim-on-Rhine, Germany. Application date, February 21, 1922.

Any soluble salt of papaverine, such as the sulphate or phosphate, or an acid solution containing papaverine, is treated with salts of nitrous acid, yielding a mixture of papaverine nitrite and papaverine, which are precipitated. The latter may be removed from the mixture by solution in benzol, alcohol, toluol, tetrahydronaphthalene, or the like, or its precipitation may be prevented by the presence of these solvents in the reaction mixture. The remaining nitrite may be washed with water and with the solvents for papaverine. Several examples of the preparation are given.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 174,574 (Chemical Research Syndicate, Ltd.), relating to production of low boiling point saturated hydrocarbons from heavy hydrocarbon oils, see Vol. VI, p. 433; 181,719 (A. Dessemond and A. H. Delclève), relating to a process of making prussian blue, starting from coal-gas, see Vol. VII, p. 284; 187,195 (A. Nathansohn), relating to recovery of lead compounds, see Vol. VII, p. 867.

#### International Specifications not yet Accepted

191,037. HYDROCARBONS, PURIFYING AND DISTILLING. W. Dederich, Imperial Buildings, Ludgate Circus, London. (Assignee of P. von Ditmar, 49, Schauenburgerstrasse, Hamburg, Germany.) International Convention date, December 31, 1921.

Crude petroleum is desulphurised by heating to 100°-110° C. with soaps of sodium, iron or alkaline earth metals. Alternatively, the oil may be heated with small pieces of ferrous sulphide, or the vapour may be passed through a solution of the soap. In another case, a mixture of the oil with a solution of soap in burning oil distillates is acidified to precipitate the metal of the soap, and then neutralised by alkali. A catalyst may also be used, such as 0.5 per cent. of sodium, or a little water. The fractions obtained on distillation are clean and sharp.

191,064. 1-PHENYLIMINO-2-NAPHTHOQUINONE. Soc. Anon. des Matières Colorantes et Produits Chimiques de St. Denis, 105, Rue la Fayette, Paris. A. Wahl, 14 bis, Boulevard Cotte, Engheim, Seine-et-Oise, France, and R. Lantz, 226, Rue la Fayette, Paris. International Convention date, December 28, 1921. Addition to 182,084. (See THE CHEMICAL AGE, Vol. VII, p. 284.)

2-oxy-1-phenyl-naphthylamine is prepared as described in 182,084, dissolved in caustic soda and alcohol, and treated with a concentrated solution of sodium hypochlorite at a temperature of about 5° C., the amine being oxidised to 1-phenylimino-2-naphthoquinone. A green crystalline precipitate separates, which may be recrystallised from dilute acetone or a mixture of ether and petroleum ether. The product yields a blue solution in organic solvents and a reddish-brown solution in sulphuric acid.

191,085. VULCANISING INDIARUBBER. S. M. Cadwell, 200, Ames Avenue, Leonia, N.J., U.S.A. International Convention date, March 25, 1921. Addition to 177,493. (See THE CHEMICAL AGE, Vol. VI, p. 705.)

A thiuramdisulphide containing substituted alkyl and aryl groups is used as a vulcanisation accelerator. In an example dimethyl-diphenyl-thiuramdisulphide is prepared by the reaction of monomethylaniline 480 parts, carbon disulphide 170 parts, and iodine 285 parts, dissolved in alcohol and allowed to stand until crystals separate. A rubber mixture may be composed of rubber 100 parts, zinc oxide 10 parts, sulphur 3 parts and the accelerator 0.1 part. Other examples of accelerators are diethyl-diphenyl-thiuramdisulphide, and diparamethyl-phenylene-dimethyl-thiuramdisulphide.

#### LATEST NOTIFICATIONS.

193,385. Manufacture of dyestuffs capable of being chromed. Soc. of Chemical Industry in Basle. February 18, 1922.

193,398. Apparatus for measuring and transmitting expressions of any kind of physical or chemical values. Roucka, E. February 14, 1922.

#### Specifications Accepted, with Date of Application

170,302. Ergotamine salts, Manufacture of. Chemische Fabrik vorm. Sandoz. October 14, 1920. Addition to 125,396 and 149,056.

172,010. Mechanical sulphate furnaces, Construction of. R. Moritz. November 23, 1920.

174,085-7-8. Cracking hydrocarbon oils, coal tar and the like, Process and apparatus for. Gulf Refining Co. January 15, 1921.

186,936. Centrifugally separating substances, Method and mechanism for. Sharples Specialty Co. October 7, 1921.

187,223. Absorbing gases or vapours by means of charcoal, Apparatus for. Farbwerke vorm. Meister, Lucius and Brüning. October 10, 1921.

191,029. Aliphatic arsenical compounds, Manufacture of. Etablissements Poulenc Frères and C. Oetichlin. December 30, 1921.

192,741. Low carbon ferro-chromium, Manufacture of. W. L. Turner. October 12, 1921.

192,745. Natural cellular structures containing xanthine derivatives, Process of purifying. N. Rosewater. October 13, 1921.

192,772. Metallic paints and means for producing the same. J. A. Ritchie. November 8, 1921.

192,778. Fertiliser, Production of material suitable for use as. E. L. Pease. November 8, 1921.

192,791. Fixation of atmospheric nitrogen, Process for. F. C. Dych-Teague, A. Wilson-Hughes, and F. J. Commin. November 11, 1921.

192,816. Coal and other carbonaceous matter, Treatment of—for obtaining products therefrom. P. Dvorkovitz. November 17, 1921.

192,842. New dyestuffs, Manufacture of. A. G. Bloxam. (Akt.-Ges. für Anilin Fabrikation.) November 28, 1921.

192,849. Light hydrocarbons from carbon, mineral oils and heavy hydrocarbons, Process for manufacturing, by means of pressure or heat with or without hydrogen. F. Bergius and S. Löffler. November 30, 1921.

192,850. Solid carbonaceous substances, mineral oils and heavy hydrocarbons, Process for the treatment of, by heat and high pressure, with or without hydrogen. F. Bergius and S. Löffler. November 30, 1921.

192,880. Generating gas from coal, Apparatus for. C. B. Tully. December 20, 1921.

192,941. Formaldehyde condensation products of phenols, Method of manufacturing. J. G. Byrom and R. Attwater. March 1, 1922.

192,944. Separating oxygen from atmospheric air. Woodall, Duckham and Jones (1920), Ltd., and J. S. Morgan. March 1, 1922.

192,949. Drying or otherwise treating material in a vacuum, Method of and apparatus for. O. Minton. March 8, 1922.

192,970. Compact metallic beryllium, Process for electrolytically manufacturing. H. Goldschmidt and A. Stock. April 19, 1922.

#### Applications for Patents

Aktieselskapet de Norske Saltverker. Production of coarse crystals etc., from solutions. 4842. February 19. (Norway, March 11 1922.)

Aktieselskapet de Norske Saltverker. Treatment of solutions for precipitation of solid substances therefrom. 4843. February 19. (Norway, March 29, 1922.)

Auld, S. J. M., Dunstan, A. E., and Herring, P. H. Treatment of liquid hydrocarbons. 4924. February 20.

British Cellulose and Chemical Manufacturing Co., Ltd. Manufacture of artificial threads, etc. 5441. February 24.

Du Pont de Nemours and Co., E. I., and Nobel Industries, Ltd. Explosives. 5355. February 23.

Durand et Huguenin Soc. Anon. Manufacture of highly-chlorinated hydro-aromatic products containing nitrogen. 4965. February 20. (Switzerland, February 23, 1922.)

Farbwerke vorm. Meister, Lucius, and Brüning. Manufacture of azo-dyestuffs. 5465. February 24. (Germany, February 24, 1922.)

Heyl, G. E. Process for obtaining sulphur-freeable oils from sulphur-containing materials. 5314. February 23.

Hyndman, F. Use of cellulose acetate. 5340. February 23.

Lamoureux, W. F. Manufacture of sulphuric acid. 4873. February 20.

Lamoureux, W. F. Manufacture of sulphuric acid. 5286. February 23. (United States, May 29, 1922.)

Margulies, O. Production of organic arsenic compounds. 5374. February 23.

National Benzole Association and Williams, E. C. Process of treating aromatic hydrocarbons. 5308. February 23.

Pickett, F. N. Method of removing chloropicrin from stannic chloride pentahydrate solution. 4837. February 19.

#### Patents Court Cases

APPLICATIONS have been made for the following patents to be indorsed "Licences of Right" under Section 24 of the Patents and Designs Acts, 1907 and 1919: 119,040 and 141,505 (O. F. Stafford), relating to a process of destructive distillation of wood. Any notice of objection must be given by March 21, 1923.

#### A New Research Laboratory

##### Interesting Development at Wembley

AN interesting research laboratory belonging to the General Electric Co., Ltd., was opened at Wembley on Tuesday, February 27, by Mr. Hugo Hirst, chairman of the company, Sir J. J. Thomson and Lord Robert Cecil being present. Until quite recently the General Electric Co. only employed a few trained research workers. The investigations of these men, in a very brief period, proved that scientific research could help manufacture in a high degree.

When metallic filament gas-filled lamps began to be made there was a very high percentage of losses—due to lamps flashing or bursting under test. The factory could find no explanation for this phenomenon, and the research staff was put on to investigate it. A very short time enabled the scientists to demonstrate that "flashing" was due to the faulty vacuum or improper charging with the inert gas employed which went under factory methods. The correct vacuum and charge of gas for the lamps was ascertained in the research department, and the proper method of manufacture ascertained, with the result that the loss due to "flashing" fell to 15 per cent. and in certain special cases to as low as 5 per cent. By this one achievement the research department more than justified its existence, and the General Electric Co., convinced of its value, decided to build properly-equipped laboratories. The company have included a small scale factory in the laboratories to test in practice the value of any improvements devised.

With a frontage of 400 ft., and a total floor area of 80,000 sq. ft., the laboratory consists essentially of two one-storey buildings placed on each side of a central corridor running east and west, with centre and west wings running north. The main laboratories are arranged on each side of this corridor. Among the principal departments now at work are those for vacuum physics, lamp development, thermionic valves, life test of lamps, photometry, primary batteries, the production of metallic tungsten, and the drawing of tungsten wires for filaments, metallurgy and microscopy.

#### Unsuccessful Claim against a Chemical Co.

At Lambeth County Court, before Judge Parry, on Friday, February 23, Frederick Usher, general dealer, of Dalbiac Street, Camberwell, brought an action against the Elephant Chemical Co., Ltd., of 171-3, Neate Street, Camberwell, claiming £75 damages for trespass and loss of profit through defendants demolishing a shed at the rear of his premises. The secretary of the company, Miss Harris, stated that the plaintiff agreed to the removal of the shed, and the first they heard of any objection was when they received a letter from his solicitor. Judge Parry stopped the case, and gave judgment for the defendants with costs.

## Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

London, March 1, 1923.

QUITE a good volume of trade has been evident during the past week, and values on the whole tend upwards.

It is becoming increasingly evident that the position, so far as delivery of many foreign chemicals is concerned, is becoming more acute, and supplies coming through from that part of Germany in French occupation are meagre in the extreme.

There has been quite a substantial export inquiry, particularly for those chemicals which foreign makers have recently been drawing from Germany. The business actually completed is more satisfactory.

### General Chemicals

ACETONE is a firm and active market. Spot supplies are very scarce, and makers are sold well ahead.  
ACETIC ACID is much firmer. There is very little available for early delivery, and the forward situation is very uncertain, largely on account of the German position.  
ACID CITRIC.—The firm tendency is maintained and higher prices are looked for in the near future.  
ACID FORMIC.—The immediate tendency is in buyers' favour, but if German supplies are shut off the position may change rapidly.  
ACID LACTIC is in better demand. Price unchanged.  
ACID OXALIC is a slow market, but price is inclined to harden in sympathy with the general position.  
ARSENIC is in very short supply for early delivery, but on the whole the position is perhaps rather easier, the buying pressure having diminished.  
BARIUM CHLORIDE is firm and seems likely to improve in value.  
FORMALDEHYDE is very scarce, and the price is still moving upwards.  
LEAD ACETATE is firm, and the demand is much better.  
METHYL ALCOHOL is very scarce, the high grade qualities being practically unobtainable.  
POTASSIUM CARBONATE is uninteresting.  
POTASSIUM CAUSTIC.—Very little business is visible. The price continues to droop.  
POTASSIUM PERMANGANATE is higher in price and in short supply.  
POTASSIUM PRUSSATE is a firm market, and the limited supplies are easily absorbed.  
SODA ACETATE has improved in value in consequence of the increased demand.  
SODIUM HYPOSULPHITE.—Unchanged.  
SODIUM NITRITE is a firm market, and the price is hardening.  
SODIUM PRUSSATE has been in good demand on early home trade requirements. A larger interest is also being taken on export account.  
SODIUM SULPHIDE is without special feature.  
ZINC OXIDE is a very firm market. Supplies in all positions are difficult to arrange for.

### Pharmaceutical Chemicals

ACETYL SALICYLIC ACID has been very firm and active, buyers apparently considering it advisable to anticipate their requirements.  
ACETANILID.—Spot unchanged. Large export orders are keeping Continental manufacturers busy. Hamburg dealers are asking higher prices.  
ACID SALICYLIC.—As foreshadowed last week, the market has again advanced sharply. In view of the carboic acid situation the firm tendency is likely to continue.  
AMIDOPYRIN.—Although the spot price remains unchanged, Continental makers are asking more for forward, due doubtless to the increased export demand.  
BROMIDES.—While London prices remain unchanged Continental makers are declining fresh orders, apparently with a view to reconsidering the situation.  
MILK SUGAR.—Unchanged. A good business has been done, shipments arriving finding a ready market.  
PHENACETIN.—In view of the German situation stocks are difficult to replace, and holders are gradually advancing prices.

PHENAZONE continues firm and in good request. Continental manufacturers are sold well ahead, export demand being brisk.

SODA BENZOATE is steady. Makers are fully sold and decline to enter into further commitments, as present prices are unremunerative.

SODA SALICYLATE is selling freely at the advanced price notified last week.

VANILLIN is slightly easier owing to the competition among the English makers.

### Coal Tar Intermediates

No very large business has been placed during the past week, but a healthier feeling is about and holders are fairly firm in their ideas.

ALPHA NAPHTHOL has been the object of some inquiry.

ALPHA NAPHTHYLAMINE is firm and some fair home business has been done.

ANILINE OIL AND SALT continue in moderate request at last quoted prices.

BENZIDINE BASE is without special feature.

BETA NAPHTHOL is steady with small inquiry about.

DIMETHYLANILINE is very fair and some orders have been booked.

NAPHTHONIC ACID.—Some home inquiries have been received.

NITRO BENZOL.—A certain amount of home business is passing.

PARANITRANILINE.—Some export inquiries have been received.

PARAPHENYLENEDIAMINE is a quiet trade.

"R" SALT.—Some home orders are in the market.

XYLIDINE is without special feature.

### Coal Tar Products

The improved tone in coal tar products is well maintained, and supplies for prompt delivery are in some cases difficult to obtain.

90% BENZOLE is steady, at about 1s. 7½d. to 1s. 8d. per gallon on rails in the Midlands.

PURE BENZOLE is steady at 2s. per gallon in the North, and 2s. 4d. to 2s. 6d. per gallon in the South.

CREOSOTE OIL maintains a firm tone, and is worth about 8½d. per gallon in the Midlands and North, and 9½d. to 9½d. per gallon in the South.

CRESYLIC ACID has a rather better inquiry, although the price remains unchanged at 2s. per gallon on rails for the pale quality 97/99%, and 1s. 9d. for the dark quality 95/97%.

SOLVENT NAPHTHA is quiet for prompt delivery, at about 1s. 6d. per gallon on rails in the North, and 1s. 10d. to 2s. per gallon in London.

HEAVY NAPHTHA is unchanged at 1s. 6d. per gallon on rails.

NAPHTHALENE has a good demand for the crude qualities, and for the near position supplies are difficult to obtain. The lower melting points are worth about £8 per ton, whereas hot pressed quality 77/78 is worth about £12 per ton.

PITCH remains firm, and prices still have an upward tendency. To-day's quotations are: London, 180s.; East Coast, 175s. to 177s. 6d.; West Coast, 175s. to 177s. 6d. per ton f.o.b.

### Sulphate of Ammonia

There is a very good demand for home trade.

### Current Prices General Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride.....	lb.	0	1	6	to	0	1	8
Acetone oil .....	ton	90	0	0	to	95	0	0
Acetone, pure.....	ton	130	0	0	to	135	0	0
Acid, Acetic, glacial, 99-100%.....	ton	69	0	0	to	70	0	0
Acetic, 80% pure.....	ton	45	0	0	to	46	0	0
Arsenic, liquid, 2000 s.g.....	ton	100	0	0	to	105	0	0
Boric, cryst.....	ton	55	0	0	to	60	0	0
Carboic, cryst. 39-40%.....	lb.	0	1	7	to	0	1	8
Citric.....	lb.	0	1	9	to	0	1	10
Formic, 80%.....	ton	50	0	0	to	51	0	0
Hydrofluoric.....	lb.	0	0	7½	to	0	0	8½



		Per	£	s.	d.		£	s.	d.
Acid Lactic, 50 vol. ....	ton	41	0	0	to	43	0	0	
Lactic, 60 vol. ....	ton	43	0	0	to	44	0	0	
Nitric, 80 Tw. ....	ton	27	0	0	to	29	0	0	
Oxalic .....	lb.	0	0	6½	to	0	0	7	
Phosphoric, 1.5. ....	ton	40	0	0	to	42	0	0	
Pyrogallie, cryst. ....	lb.	0	5	9	to	0	6	0	
Salicylic, Technical .....	lb.	0	1	6	to	0	1	7	
Sulphuric, 92-93% ....	ton	6	10	0	to	7	10	0	
Tannic, commercial. ....	lb.	0	2	3	to	0	2	9	
Tartaric. ....	lb.	0	1	2½	to	0	1	3	
Alum, lump. ....	ton	12	10	0	to	13	0	0	
Alum, chrome. ....	ton	28	0	0	to	29	0	0	
Alumino ferric. ....	ton	9	0	0	to	9	5	0	
Aluminium, sulphate, 14-15% ....	ton	7	10	0	to	8	0	0	
Aluminium, sulphate, 17-18% ....	ton	9	10	0	to	10	0	0	
Ammonia, anhydrous ....	lb.	0	1	6	to	0	1	8	
Ammonia, .880. ....	ton	32	0	0	to	34	0	0	
Ammonia, .920. ....	ton	22	0	0	to	24	0	0	
Ammonia, carbonate. ....	lb.	0	0	4	to	0	0	4½	
Ammonia, chloride. ....	ton	50	0	0	to	55	0	0	
Ammonia, muriate (galvanisers) ....	ton	35	0	0	to	37	10	0	
Ammonia, nitrate (pure) ....	ton	35	0	0	to	40	0	0	
Ammonia, phosphate. ....	ton	65	0	0	to	68	0	0	
Ammonia, sulphocyanide, com'l, 90% lb.	0	1	1	1	to	0	1	3	
Amyl acetate. ....	ton	175	0	0	to	185	0	0	
Arsenic, white, powdered. ....	ton	70	0	0	to	75	0	0	
Barium, carbonate, Witherite ....	ton	5	0	0	to	6	0	0	
Barium carbonate, Precip. ....	ton	15	0	0	to	16	0	0	
Barium, Chlorate. ....	ton	65	0	0	to	70	0	0	
Barium Chloride. ....	ton	16	10	0	to	17	0	0	
Nitrate. ....	ton	33	0	0	to	35	0	0	
Sulphate, blanc fixe, dry. ....	ton	20	10	0	to	21	0	0	
Sulphate, blanc fixe, pulp. ....	ton	10	5	0	to	10	10	0	
Sulphocyanide, 95% ....	lb.	0	1	0	to	0	1	1	
Bleaching powder, 35-37% ....	ton	10	10	0	to	11	0	0	
Borax crystals. ....	ton	28	0	0	to	32	0	0	
Calcium acetate, Brown. ....	ton	12	10	0	to	13	10	0	
Calcium Carbide. ....	ton	19	15	0	to	20	0	0	
Chloride. ....	ton	16	0	0	to	17	0	0	
Carbon bisulphide. ....	ton	6	0	0	to	7	0	0	
Casein technical. ....	ton	35	0	0	to	40	0	0	
Cerium oxalate. ....	ton	98	0	0	to	105	0	0	
Chromium acetate. ....	lb.	0	3	0	to	0	3	6	
Cobalt acetate. ....	lb.	0	1	1	to	0	1	3	
Oxide, black. ....	lb.	0	6	0	to	0	6	6	
Copper chloride. ....	lb.	0	9	6	to	0	10	0	
Sulphate. ....	lb.	0	1	2	to	0	1	3	
Creosote Tartar, 98-100% ....	ton	27	10	0	to	28	10	0	
Epsom salts (see Magnesium sulphate)	ton	92	10	0	to	95	0	0	
Formaldehyde, 40% vol. ....	ton	92	10	0	to	95	0	0	
Formosol (Rongalite) ....	lb.	0	2	2	to	0	2	3	
Glauber salts, commercial. ....	ton	5	0	0	to	5	10	0	
Glycerin crude. ....	ton	65	0	0	to	67	10	0	
Hydrogen peroxide, 12 vols. ....	gal.	0	2	3	to	0	2	4	
Iron perchloride. ....	ton	30	0	0	to	32	0	0	
Iron sulphate (Copperas). ....	ton	3	10	0	to	4	0	0	
Lead acetate, white. ....	ton	41	0	0	to	43	0	0	
Carbonate (White Lead) ....	ton	45	0	0	to	48	0	0	
Nitrate. ....	ton	44	10	0	to	45	0	0	
Litharge. ....	ton	35	10	0	to	36	0	0	
Lithopone, 30% ....	ton	22	10	0	to	24	0	0	
Magnesium chloride. ....	ton	5	10	0	to	6	0	0	
Carbonate, light. ....	cwt.	2	10	0	to	2	15	0	
Sulphate (Epsom salts com- mercial) ....	ton	6	10	0	to	7	0	0	
Sulphate (Druggists') ....	ton	10	0	0	to	11	0	0	
Manganese Borate, commercial. ....	ton	65	0	0	to	75	0	0	
Sulphate. ....	ton	58	0	0	to	60	0	0	
Methyl acetone. ....	ton	62	0	0	to	63	0	0	
Alcohol, 1% acetone. ....	ton	105	0	0	to	110	0	0	
Nickel sulphate, single salt. ....	ton	43	0	0	to	44	0	0	
Ammonium sulphate, double salt. ....	ton	43	0	0	to	44	0	0	
Potash, Caustic. ....	ton	32	0	0	to	33	0	0	
Potassium bichromate. ....	lb.	0	0	5½	to	0	0	6	
Carbonate, 90% ....	ton	30	0	0	to	31	0	0	
Chloride, 80% ....	ton	9	10	0	to	10	10	0	
Chlorate. ....	lb.	0	0	4½	to	0	0	4½	
Metabisulphite, 50-52% ....	ton	84	0	0	to	90	0	0	
Nitrate, refined. ....	ton	43	0	0	to	45	0	0	
Permanganate. ....	lb.	0	0	9½	to	0	0	10	
Prussiate, red. ....	lb.	0	4	3	to	0	4	6	
Prussiate, yellow. ....	lb.	0	1	6	to	0	1	6½	
Sulphate, 90% ....	ton	12	10	0	to	13	10	0	
Salammoniac, firsts. ....	cwt.	3	3	0	to	—	—	—	
Seconds. ....	cwt.	3	0	0	to	—	—	—	
Sodium acetate. ....	ton	24	10	0	to	24	15	0	
Arsenate, 45% ....	ton	45	0	0	to	48	0	0	
Bicarbonate. ....	ton	10	10	0	to	11	0	0	
Bichromate. ....	lb.	0	0	4½	to	0	0	4½	

	Per	£	s.	d.		£	s.	d.
Sodium Bisulphite 60-62%.....	ton	21	0	0	to	23	0	0
Chlorate.....	lb.	0	0	3½	to	0	0	3½
Caustic, 70%.....	ton	19	10	0	to	20	0	0
Caustic, 76%.....	ton	20	10	0	to	21	0	0
Hydrosulphite, powder.....	lb.	0	1	6	to	0	1	7
Hyposulphite, commercial.....	ton	10	10	0	to	11	0	0
Nitrite, 96-98%.....	ton	28	0	0	to	29	0	0
Phosphate, crystal.....	ton	16	0	0	to	16	10	0
Sodium perborate.....	lb.	0	0	10	to	0	0	10½
Prussiate.....	lb.	0	0	9½	to	0	0	10
Sulphide, crystals.....	ton	10	10	0	to	11	0	0
Sulphide, solid, 60-62%.....	ton	16	10	0	to	17	10	0
Sulphite, cryst.....	ton	12	10	0	to	13	0	0
Strontium carbonate.....	ton	55	0	0	to	60	0	0
Strontium Nitrate.....	ton	40	0	0	to	42	0	0
Strontium Sulphate, white.....	ton	6	10	0	to	7	10	0
Sulphur chloride.....	ton	25	0	0	to	27	10	0
Sulphur, Flowers.....	ton	11	10	0	to	12	10	0
Roll.....	ton	11	0	0	to	12	0	0
Tartar emetic.....	lb.	0	1	4	to	0	1	5
Tin perchloride, 33%.....	lb.	0	1	2	to	0	1	4
Perchloride, solid.....	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals).....	lb.	0	1	4	to	0	1	5
Zinc chloride 102° Tw.....	ton	21	0	0	to	22	10	0
Chloride, solid, 96-98%.....	ton	25	0	0	to	30	0	0
Oxide, 99%.....	ton	40	0	0	to	42	0	0
Dust, 90%.....	ton	45	0	0	to	47	10	0
Sulphate.....	ton	16	10	0	to	17	10	0

## Pharmaceutical Chemicals

Acetyl salicylic acid. ....	lb.	0	2	10	to	0	3	0
Acetanilid. ....	lb.	0	1	4	to	0	1	6
Acid, Gallic, pure. ....	lb.	0	3	0	to	0	3	3
Lactic, 1.21. ....	lb.	0	2	9	to	0	3	0
Salicylic, B.P. ....	lb.	0	1	10	to	0	2	0
Tannic, lewiss. ....	lb.	0	3	4	to	0	3	6
Amidol. ....	lb.	0	8	6	to	0	8	9
Amidopyrin. ....	lb.	0	13	3	to	0	13	9
Ammon ichthosulphonate. ....	lb.	0	2	0	to	0	2	3
Barbitone. ....	lb.	0	13	0	to	0	14	0
Beta naphthol resublimed. ....	lb.	0	1	9	to	0	2	0
Bromide of ammonia. ....	lb.	0	0	7½	to	0	0	8
Potash. ....	lb.	0	0	6½	to	0	0	7
Soda. ....	lb.	0	0	7	to	0	0	7½
Caffeine, pure. ....	lb.	0	12	0	to	0	12	3
Calcium glycerophosphate. ....	lb.	0	5	9	to	0	6	0
Calcium lactate. ....	lb.	0	2	0	to	0	2	3
Calomel. ....	lb.	0	4	9	to	0	5	0
Chloral hydrate. ....	lb.	0	4	3	to	0	4	6
Cocaine alkaloid. ....	oz.	0	18	0	to	0	18	6
Cocain hydrochloride. ....	oz.	0	14	9	to	0	15	0
Corrosive sublimate. ....	lb.	0	4	3	to	0	4	6
Eucalyptus oil, B.P. (70-75% eucalyptol)	lb.	0	1	7	to	0	1	7½
B.P. (75-80% eucalyptol). ....	lb.	0	1	8	to	0	1	8½
Guaiacol carbonate. ....	lb.	0	8	3	to	0	8	6
Liquid. ....	lb.	0	9	0	to	0	9	6
Pure crystals. ....	lb.	0	10	0	to	0	10	6
Hexamine. ....	lb.	0	4	0	to	0	4	3
Hydroquinone. ....	lb.	0	3	0	to	0	3	3
Lanoline anhydrous. ....	lb.	0	0	7	to	0	0	7½
Lecithin ex ovo. ....	lb.	0	18	6	to	0	19	0
Lithia carbonate. ....	lb.	0	9	6	to	0	10	0
Methyl salicylate. ....	lb.	0	2	2	to	0	2	6
Metol. ....	lb.	0	9	6	to	0	10	0
Milk sugar. ....	cwt.	4	15	0	to	5	0	0
Paraldehyde. ....	lb.	0	1	5	to	0	1	6
Phenacetin. ....	lb.	0	5	3	to	0	5	6
Phenazone. ....	lb.	0	6	9	to	0	7	0
Phenolphthalein. ....	lb.	0	5	0	to	0	5	3
Potassium sulpho guaiacolate. ....	lb.	0	5	0	to	0	5	3
Quinine sulphate, B.P. ....	oz.	0	2	3	to	—	—	—
Resorcine, medicinal. ....	lb.	0	5	3	to	0	5	6
Salicylate of soda powder. ....	lb.	0	2	3	to	0	2	6
Crystals. ....	lb.	0	2	4	to	0	2	7
Salol. ....	lb.	0	2	3	to	0	2	6
Soda Benzoate. ....	lb.	0	2	0	to	0	2	3
Sulphonal. ....	lb.	0	13	6	to	0	14	0
Terpene hydrate. ....	lb.	0	1	9	to	0	2	0
Theobromine, pure. ....	lb.	0	12	0	to	0	12	6
soda salicylate. ....	lb.	0	8	0	to	0	8	6
Vanillin. ....	lb.	1	2	6	to	1	3	6

## Coal Tar Intermediates, &amp;c.

Alphanaphthol, crude. ....	lb.	0	2	0	to	0	2	3
Alphanaphthol, refined. ....	lb.	0	2	6	to	0	2	9
Alphanaphthylamine. ....	lb.	0	1	6	to	0	1	7
Aniline oil, drums extra. ....	lb.	0	0	9½	to	0	0	10
Aniline salts. ....	lb.	0	0	9½	to	0	0	10
Anthracene, 40-50% ....	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine) ....	lb.	0	3	0	to	0	3	3
Benzenidine, base. ....	lb.	0	5	0	to	0	5	3

	Per	£	s.	d.	£	s.	d.
Benzidine, sulphate.....lb.	0	3	9	to	0	4	0
Benzoic acid.....lb.	0	2	0	to	0	2	3
Benzyl chloride, technical.....lb.	0	2	0	to	0	2	3
Betanaphthol.....lb.	0	1	2½	to	0	1	3
Betanaphthylamine, technical.....lb.	0	4	0	to	0	4	3
Croceine Acid, 100% basis.....lb.	0	3	3	to	0	3	6
Dichlorobenzol.....lb.	0	0	9	to	0	0	10
Diethylaniline.....lb.	0	4	6	to	0	4	9
Dinitrobenzol.....lb.	0	1	1	to	0	1	2
Dinitrochlorbenzol.....lb.	0	0	11	to	0	1	0
Dinitronaphthalene.....lb.	0	1	4	to	0	1	5
Dinitrotoluol.....lb.	0	1	4	to	0	1	5
Dinitrophenol.....lb.	0	1	7	to	0	1	9
Dimethylaniline.....lb.	0	2	6	to	0	2	9
Diphenylamine.....lb.	0	3	9	to	0	4	0
H-Acid.....lb.	0	5	0	to	0	5	3
Metaphenylenediamine.....lb.	0	4	0	to	0	4	3
Monochlorbenzol.....lb.	0	0	10	to	0	1	0
Metanilic Acid.....lb.	0	5	9	to	0	6	0
Metatoluylenediamine.....lb.	0	4	0	to	0	4	3
Monosulphonic Acid (2.7).....lb.	0	5	6	to	0	6	0
Naphthionic acid, crude.....lb.	0	2	3	to	0	2	6
Naphthionate of Soda.....lb.	0	2	6	to	0	2	9
Naphthylamin-di-sulphonic-acid.....lb.	0	4	0	to	0	4	3
Neville Winther Acid.....lb.	0	7	9	to	0	8	0
Nitrobenzol.....lb.	0	0	8	to	0	0	8
Nitronaphthalene.....lb.	0	1	0	to	0	1	1
Nitrotoluol.....lb.	0	0	8	to	0	0	9
Orthoamidophenol, base.....lb.	0	12	0	to	0	12	6
Orthodichlorbenzol.....lb.	0	1	0	to	0	1	1
Orthotoluidine.....lb.	0	0	10	to	0	0	11
Orthonitrotoluol.....lb.	0	0	3	to	0	0	4
Para-amidophenol, base.....lb.	0	8	6	to	0	9	0
Para-amidophenol, hydrochlor.....lb.	0	7	6	to	0	8	0
Paradichlorbenzol.....lb.	0	0	6	to	0	0	7
Paranitraniline.....lb.	0	3	0	to	0	3	3
Paranitrophenol.....lb.	0	2	3	to	0	2	6
Paranitrotoluol.....lb.	0	2	9	to	0	3	0
Paraphenylenediamine, distilled.....lb.	0	11	6	to	0	11	9
Paratoluidine.....lb.	0	5	9	to	0	6	3
Phthalic anhydride.....lb.	0	2	6	to	0	2	9
Resorcin, technical.....lb.	0	4	0	to	0	4	3
Sulphanilic acid, crude.....lb.	0	0	10	to	0	0	11
Tolidine, base.....lb.	0	7	3	to	0	7	9
Tolidine, mixture.....lb.	0	2	6	to	0	2	9

### Essential Oils and Synthetics

ESSENTIAL OILS.		£	s.	d.
Anise.....c.i.f. 1/10 spot, dull		0	2	0
Bay.....firmer		0	11	0
Bergamot.....firmer		0	12	0
Cajuput.....		0	3	9
Camphor, white.....per cwt.		4	3	6
Camphor, brown.....scarce, per cwt.		3	15	0
Cassia.....c.i.f. 7/3 spot		0	8	3
Cedarwood.....		0	1	6
Citronella (Ceylon).....quieter		0	3	3
Citronella (Java).....		0	3	6
Clove.....harder		0	7	6
Eucalyptus.....		0	1	6
Geranium Bourbon.....firmer		1	6	0
Lavender.....		0	11	0
Lavender spike.....		0	3	3
Lemon.....firmer		0	2	11
Lemongrass.....per oz.		0	0	2½
Lime (distilled).....		0	3	0
Orange sweet (Sicilian).....		0	9	0
Orange sweet (West Indian).....		0	8	6
Palmarosa.....		0	17	6
Peppermint (American).....easier		0	13	0
Mint (dementolised Japanese).....weak		0	7	0
Patchouli.....firmer		1	12	0
Otto of Rose.....per oz.		1	4	0
Rosemary.....		0	1	8
Sandalwood.....		1	6	0
Sassafras.....		0	5	0
Thyme.....according to quality 2/4 to		0	6	0
SYNTHETICS.				
Benzyl acetate.....		0	3	0
Benzyl benzoate.....		0	3	0
Citral.....		0	10	6
Coumarine.....		0	12	0
Heliotropine.....firmer		0	6	0
Ionone.....		1	7	0
Linalyl acetate.....		1	2	6
Methyl salicylate.....		0	2	3
Musk xylol.....firmer		0	9	0
Terpeniol.....		0	3	0

### The Manchester Chemical Market

[FROM OUR OWN CORRESPONDENT]

Manchester, March 1, 1923.

BUSINESS in chemicals has only been moderately active, buyers confining themselves largely to immediate needs. The tone of the market, however, remains reasonably cheerful, and prices, on the whole, have been steady, with here and there a slight movement in favour of buyers. Confidence in the future of the chemical trade has been shown on the Stock Exchange here this week, most of the leading chemical shares—Brunner-Mond, United Alkali, and Salt Union—being actively supported at higher rates.

#### Heavy Chemicals

The home and foreign demand for caustic soda keeps up and prices are firm at from £19 per ton for 60-68 per cent. to £21 10s. for 76-77 per cent. strength. Bleaching powder is also being actively inquired for both by home consumers and for shipment at £11 10s. per ton. The demand for soda crystals has improved a little and prices are firm at £5 10s. per ton, delivered. Saltcake is rather a dull section, though prices are steady at £4 10s. per ton for home consumption and about 20s. more for export. Sodium sulphide, 60-65 per cent. concentrated, is quiet and easier at £15 10s. per ton, with crystals on offer at about £9 15s. Glauber salts are also rather inactive, though the price is maintained at £4 10s. per ton. Bicarbonate of soda is still in fair demand at £10 10s. per ton, delivered to home users. Alkali is steady and in good inquiry for home and export at £7 12s. 6d. per ton for 58 per cent. material. Hyposulphite of soda meets with a very subdued demand and offers are now being made at about £15 5s. per ton for photographic crystals and £10 for commercial. Nitrite of soda is firm and in moderate inquiry at £28 per ton. Phosphate of soda is unchanged in position or value at £15 10s. per ton. Chlorate of soda is in fair demand at 2½d. per lb. Prussiate of soda is a shade lower at 9½d. per lb., only moderate supplies being taken up. Bichromate of soda is firm and in steady inquiry at 4½d. per lb. Acetate of soda is about maintained at last week's quotation of £23 10s. per ton.

Caustic potash is in good request at £30 per ton for 88-90 per cent. strength. The demand for carbonate of potash is still on the quiet side and offers of 90 per cent. material are being made at about £25 per ton. Bichromate of potash is firm and in moderate demand at 6d. per lb. Yellow prussiate of potash is maintained, though complaints as to scarcity are less frequent; the price is about 1s. 5½d. per lb. Chlorate of potash is easier at 3d. per lb. Permanganate of potash keeps in fair inquiry at 8d. per lb.

The demand for sulphate of copper has fallen off again and prices have an easier tendency at £26 5s. to £26 10s. per ton. The price of arsenic is well maintained at £75 per ton for white powdered, Cornish makes, buying for export continuing unabated. Commercial Epsom salts are firmer and in fair inquiry at about £5 10s. per ton; magnesium sulphate, B.P., is steady at £7 15s. Grey acetate of lime keeps very firm at £20 per ton and brown at £10, offers still being on the short side. Nitrate of lead keeps rather quiet, but prices are firmer at about £42 10s. per ton. White sugar of lead is steady and in moderate demand at £39 per ton, with brown quoted at about 20s. less.

#### Acids and Tar Products

Tartaric acid is steady at 1s. 2d. per lb., but business is rather quiet again. Citric acid, P.B. crystals, is unchanged from last week at about 1s. 8d. per lb. for prompt delivery. Acetic acid is only in moderate demand at £65 for glacial and £43 per ton for 80 per cent. technical. Oxalic acid keeps quiet at 6½d. per lb.

Pitch is firmer again at round £8 per ton f.o.b. Manchester, the Continental demand being well maintained. Carbolic acid crystals are also stronger on continued good inquiry at 1s. 3½d. per lb.; crude, 60 per cent. material is scarce and about 3s. 6d. per gallon is now being asked. Benzole is quiet at 1s. 8d. per gallon. Solvent naphtha shows little improvement though the price is steady at 1s. 9d. per gallon. Creosote oil is still in good inquiry at 8½ to 9d. per gallon. Naphthalenes have improved slightly; refined is quoted at £17 per ton and crude at up to £9.

## Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, February 28, 1923.

THE past week has brought rather more inquiry, but the amount of business actually booked has been relatively small.

Continental prices maintain their upward tendency. Potashes especially being much firmer.

### Industrial Chemicals

ACID ACETIC.—Glacial 98/100%, £59 to £63 per ton; 80% pure, £43 to £45 per ton; 80% technical, £42 10s. to £44 per ton, c.i.f. U.K. ports. Moderate export inquiry.

ACID BORACIC.—Crystal or granulated, £55 per ton; powdered, £57 per ton, carriage paid U.K. stations.

ACID CITRIC.—B.P. crystals unchanged at 1s. 6d. to 1s. 7d. per lb.

ACID FORMIC, 80%.—Price about £55 to £57 per ton, ex wharf.

ACID HYDROCHLORIC.—Unchanged, 6s. 6d. per carboy, ex works.

ACID NITRIC, 84%.—£27 10s. per ton, ex station, full truck loads.

ACID OXALIC.—Spot lots offered at 6½d. per lb. Continental prices about 6½d., c.i.f. U.K.

ACID SULPHURIC.—144°, £3 15s. per ton; 168°, £7 per ton, ex works, full loads. De-arsenicated quality, £1 per ton more.

ACID TARTARIC.—Now quoted 1s. 2½d. per lb., ex store.

ALUM LUMP POTASH.—Price about £12 10s. per ton, ex store.

AMMONIA, ANHYDROUS.—Unchanged at 1s. 6d. per lb., ex station.

AMMONIA CARBONATE.—Lump, 4d. per lb.; ground, 4½d. per lb., delivered.

AMMONIA MURIATE.—Grey galvanisers quality, about £3 1s. per ton, f.o.r. works; fine white crystals, £25 10s. per ton, ex wharf.

AMMONIA SULPHATE.—25¼%, £15 10s. per ton; 25½% £16 13s. per ton, ex works, March/May delivery.

ARSENIC, WHITE POWDERED.—Now quoted at £76 per ton, ex wharf, prompt delivery.

BARIUM CHLORIDE.—98/100% offered from Continent at £15 5s. per ton, c.i.f. U.K.

BARYTES.—Fine white English, £5 5s. per ton, ex works, Continental slightly cheaper, c.i.f. U.K.

BLEACHING POWDER.—£11 10s. per ton, ex station, spot delivery; contracts 20s. per ton less.

BORAX.—Crystal or granulated, £28 per ton; powdered, £29 per ton, carriage paid U.K. stations.

CALCIUM CHLORIDE.—English make, £5 15s. per ton, ex quay or station. Continental make, £4 5s. per ton, c.i.f. U.K.

COPPER SULPHATE.—Offered at £25 10s. per ton, ex station.

COPPERAS, GREEN.—Quoted £2 10s. per ton, f.o.b. U.K.

DEXTRINE.—Finest Dutch at about £20 per ton, c.i.f. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £90 per ton, c.i.f. U.K. ports.

GLAUBER SALTS.—Spot lots, £4 per ton, ex store.

LEAD, RED.—English make again advanced by £1 per ton. Now £43 per ton, carriage paid U.K. stations. Continental material £37 per ton, ex store.

LEAD, WHITE.—English make now £54 5s. per ton, carriage paid U.K. stations.

LEAD ACETATE.—White crystals offered at £39 per ton, ex wharf, spot delivery.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex station.

MAGNESIUM CHLORIDE.—Spot lots about £3 10s. per ton, ex store. Offered from Continent at £2 10s. per ton, c.i.f. U.K.

POTASSIUM BICHRIMATE.—Price now 5½d. per lb.

POTASSIUM CARBONATE, 90/92%.—Inclined to be higher at £27 10s. per ton, ex store.

POTASSIUM CAUSTIC, 88/92%.—Continental prices now about £29 10s. per ton, c.i.f. U.K. Spot lots offered at £30 per ton, ex store.

POTASSIUM CHLORATE.—Quoted 3d. per lb., spot delivery.

POTASSIUM NITRATE (SALTPETRE).—Price about £24, per ton, ex wharf; little demand.

POTASSIUM PERMANGANATE.—B.P. crystals about 9½d. per lb., ex store.

POTASSIUM PRUSSIAN (YELLOW).—Slightly cheaper at about 1s. 5½d. per lb., spot delivery.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station; m.w. quality, £1 10s. per ton less.

SODIUM BICHRIMATE.—Unchanged at 4½d. per lb.

SODIUM CARBONATE.—Soda crystals, £5 5s. per ton, ex quay or station; alkali, 58%, £8 17s. 6d. per ton, ex quay or station.

SODIUM CAUSTIC.—76/77%, £21 10s. per ton; 70/72%, £20 per ton; 60/62%, broken, £21 5s. per ton; 98/99%, powdered, £24 17s. 6d. per ton, ex station, spot delivery.

SODIUM CHLORATE.—Now quoted 2½d. per lb., ex store.

SODIUM HYPOSULPHITE.—Commercial crystals, £10 per ton; pea crystals, £15 10s. per ton, ex station.

SODIUM NITRATE.—Refined, 96/98% quality, quoted £13 5s. per ton, f.o.r. or f.o.b. U.K.

SODIUM PRUSSIAN (YELLOW).—Now offered at 9d. per lb., ex store.

SODIUM SULPHATE (Saltcake 95%).—Price for home consumption, £4 per ton, on contract. Good export inquiry, and little available for prompt shipment.

SODIUM SULPHIDE 60/62%.—Continental quotations higher. Now offered at £13 15s. per ton, c.i.f. U.K.

SULPHUR.—Government surplus stocks of Sicilian thirds still available at £3 10s. to £3 15s. per ton, ex depot; flowers, £10 per ton; roll, £9 per ton; rock, £8 per ton; ground, £8 per ton. Prices nominal.

TIN CRYSTALS.—Unchanged at 1s. 2d. per lb.

ZINC SULPHATE.—Technically pure crystals, £14 10s. per ton, ex station.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

### Coal Tar Intermediates and Wood Distillation Products

ALPHA NAPHTHYLAMINE.—Good inquiry. Price quoted, 1s. 6½d. per lb., casks included, carriage paid.

ANTHRANILIC ACID.—Some inquiry. Price quoted 10s. per lb., 100% basis, carriage paid, packages free.

BETA NAPHTHOL.—In good demand. Price now, 1s. 1d. per lb., ton lots, carriage paid, casks included.

DIMETHYLANILINE.—In good demand. Very scarce. Quoted at 2s. 11d. per lb., carriage paid, drums extra, returnable.

"G" SALT.—Fair inquiry. Offered at 3s. 3d. per lb., 100% basis, carriage paid, casks free.

METHYL ALCOHOL, PURE.—Offered at £101 per ton net, c.i.f. Hull, drums free.

MONONITROTOLUOL.—Some inquiry. Offered at 9d. per lb. delivered, drums returnable.

NAPHTHIONATE OF SODA.—Fair inquiry. Offered at 2s. 7d. per lb., 100% basis, carriage paid, casks included.

NAPHTHIONIC ACID.—Price quoted, 2s. 6d. per lb., 100% basis, carriage paid, packages inclusive.

NEVILLE WINTHER ACID.—Small inquiry. Price quoted, 6s. per lb., 100% basis, carriage paid, casks included.

NITRO NAPHTHALENE.—Good inquiry. Offered at 1s. per lb., carriage paid, casks included.

PARA AMIDO ACETANILIDE.—Small inquiry. Offered at 5s. 3d. per lb., 100% basis, delivered, packages free.

PARADICHLOROBENZOL.—Good export inquiries. Offered at £50 per ton, packages free, f.o.b. U.K. port.

PARANITRANILINE.—Good inquiry. Ton lots offered at 2s. 7d. per lb., packages free.

PARAPHENYLENEDIAMINE.—Fairly good inquiry. Price quoted, 12s. per lb., delivered, packages free.

PHTHALIC ANHYDRIDE.—Some inquiry. Offered at 2s. 6d. per lb., package and carriage extra.

ORTHODICHLOROBENZENE.—Some inquiry for export. Offered at £62 per ton, f.o.b., drums included.

ORTHONITROCHLOROBENZOL.—Some inquiry for export. Offered at 1s. per lb., f.o.b., drums included.

TOLIDINE BASE.—Small inquiry. Price quoted, 7s. 3d. per lb., 100% basis, carriage paid, packages free.



## Company News

**DOMINION GLASS CO.**—A dividend of  $1\frac{1}{2}$  per cent. on common stock is announced, payable on April 2. Last year the dividend was  $1\frac{1}{2}$  per cent.

**DOMINION TAR AND CHEMICAL CO.**—A final dividend of  $2\frac{1}{2}$  per cent. has been declared, free of tax, making a total of  $12\frac{1}{2}$  per cent. for the year.

**DAY AND MARTIN, LTD.**—At an extraordinary general meeting of the company on February 27 it was agreed to proceed with the disposal of the business.

**BABCOCK AND WILCOX, LTD.**—With reference to a rumour current in certain quarters that the company is contemplating an amalgamation with Stewarts and Lloyds, Ltd., the secretary has denied knowledge of such a proposal.

**UNITED TURKEY RED CO., LTD.**—The accounts for 1922 show a loss of £56,184, after deduction of £11,531 carried forward, leaving £44,653. The dividend on preference shares which has been paid absorbed £9,384, leaving a debit balance of £54,037 to carry forward.

**WILLIAM GOSSAGE AND SONS.**—The accounts for the year to November 30 last show, after providing for all charges, a balance at the credit of profit and loss of £174,470. After paying a preference dividend the directors recommend a dividend on the ordinary shares of 20 per cent., leaving £3,220 to be carried forward.

**TUBIZE SILK CO.**—Net profits for 1922 were 20,499,626 fr. compared with 5,195,278 fr. for 1921. Dividends recommended are 22½ fr. (Belgian) on ordinary shares and 25 fr. on privilege shares. It will be remembered that under contracts entered into in 1922 this firm buys cellulose acetate from the British Cellulose Co. and manufactures artificial silk from it in Belgium.

**CANADA CEMENT CO.**—The report for 1922 shows an income of \$2,403,101 after allowing for depreciation. The balance on December 31, 1921, was \$614,040, allowances for reserve, insurance, etc., being fixed at \$543,983. A dividend of \$735,000 is declared on preferred and \$810,000 on ordinary stock. The balance being \$39,119, giving a total surplus of \$653,159.

**COURTAULDS, LTD.**—The report of the directors for the year to December 31 last states that, after charging depreciation, etc., the profits amount to £3,018,432, and £418,467 was brought in, making £3,436,899. An interim dividend for 1922 has already been paid, absorbing £750,000, and the directors have decided to place to general reserve account £1,000,000. The available balance is, therefore, £1,686,899, and the directors recommend that a final dividend of 1s. 9d. per share, free of tax, amounting to £1,050,000, be declared for the year, that £636,899 be carried forward, and that the dividend be paid on March 8.

### Liquidation of the Maastricht Zinc White Co.

UNDER a winding up order made against the Maastricht Zinc White Co., Ltd., 84, Leadenhall Street, London, pigment, colour, oil and dye merchants, manufacturers and agents, on January 16, the statutory meetings of the creditors and of the shareholders were held on February 23 at the Board of Trade Offices, 33, Carey Street, London. It appeared that the company was registered in November, 1910, with a nominal capital of £2,000, afterwards increased to £10,000, its objects being to carry on business as merchants, manufacturers and agents for the sale of pigments, colours, dyes and oils, the primary object of the company being to act as sole concessionaires in this country for the products of the Maastricht Co. The failure of the company was attributed by Mr. Nye to the action of the Dutch company in refusing to transact any further business with the company and to the action of the Inland Revenue authorities in assessing the company on profits alleged to have been made by the Dutch Company. The Official Receiver dealt with a proof of debt lodged by the Attorney-General on behalf of the King for £99,477 in respect of income tax and excess profits duty, but Mr. Nye disputed that the company was liable. According to the statement of affairs the liabilities amounted to only £156, while the assets consisted of a bad book debt of £436. The meetings resulted in the liquidation remaining in the hands of the Official Receiver.

## Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIAL.	REF. No.
Egypt .....	Oils, dyes, etc. ..	—
Washington ...	Calcium arsenate	D.O.T. 5411/T.C./C.C./2.
Latvia .....	Kerosene .....	D.O.T. 7058/F.R./C.P.
U.S.A. ....	Glue .....	D.O.T. 18088/F.W./C.C./2.

### "Chemical Age" Inquiry List

The following inquiries have been received from readers of "The Chemical Age." Replies addressed to the box number given below, c/o "The Chemical Age," 8, Bowverie Street, London, E.C.4, will be forwarded to the inquirers.

Manufacturers of caustic soda, soda crystals, soda ash and silicate of soda.—No. H16.

Manufacturers of carbon monoxide in cylinders.—No. H17.

### Tariff Changes

**AUSTRIA.**—Among articles for which it is now necessary to obtain export licence are:—Fertilising salts (natural or manufactured), animal and bone manure, gas purifying material.

**ROUMANIA.**—Import duties on raw sulphur are now reduced, but among other articles subject to increased duty are tartaric and citric acids and calcium carbide. The export duty on caustic soda has been altered to 1,000 lei per wagon.

**AUSTRALIA.**—The special "dumping exchange" duty is now leviable on aspirin tablets or any tablets of acetylsalicylic acid of German origin and the special "dumping preference" duty to scientific glassware and apparatus of German origin.

**UNITED STATES OF AMERICA.**—A retaliatory duty, to be imposed where other countries impose duties in excess of the U.S. duty, does not apply to chemicals and allied products exported for the United Kingdom. The free list articles in respect of which this "countervailing" duty applies include calcium acetate and chloride calcium nitrate, and cyanamid; cement; and various explosives. Particulars of the new duties were published in the Board of Trade Journal of February 8, p. 178.

### Contracts Open

Tenders are invited for the following articles. The latest dates for receiving tenders are, when available, given in parentheses:

**MANCHESTER GAS COMMITTEE** (March 8).—About 2,800 tons of new oxide of iron. Specifications from the Secretary, Gas Department, Town Hall, Manchester.

**PERTSHIRE COUNTY COUNCIL** (March 7).—(a) Tar, pitch and bitumens; (b) blasting gelatine, gunpowder, detonators etc. Specifications from Mr. W. L. Gibson, Road Surveyor, Dunblane.

**WASHINGTON.**—5 to 10 million pounds of calcium arsenate, at least 40 per cent. pentoxide. Particulars from the Department of Overseas Trade (Room 53), Old Queen Street, Westminster, S.W.1.

**LATVIA** (March 10).—Fifty tons of kerosene. Particulars from the Department of Overseas Trade, 35, Old Queen Street, London. Reference No., 7058/F.R./C.P.

### Estimation of Hydrosulphite

**MESSRS. BROTHERTON AND CO.,** of Leeds, have introduced at their Port Rainbow works, Cheshire, a new and more rapid method of volumetric estimation of the strength of sodium hydrosulphite. The particulars of this method, which is quite simple, are published by the firm in the form of a leaflet, which will be sent on application to firms interested in the use of hydrosulphite.

# THE BRITISH ALIZARINE COMPANY LTD.

**Manchester****London****Glasgow**

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(all shades)

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(soluble and insoluble)

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(of all qualities)ALIZUROL GREEN  
(Viridine)

ALIZANTHRENE BLUE

ALIZARINE BLUES  
(soluble and insoluble)

ALIZARINE CYANINE

ALIZARINE ORANGE

ALIZARINE BLUE BLACK

ALIZARINE MAROON

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BRITALIZ GLASGOW

All communications should be  
addressed to

The British Alizarine Co., Ltd.  
Trafford Park, Manchester

## Commercial Intelligence

*The following are taken from printed reports, but we cannot be responsible for any errors that may occur.*

### County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

DAWSON, Mr. D., 74, King William Street, Blackburn, chemist. (C.C., 3/3/23.) £11 18s. 6d. January 11.  
EDWARDS, James Macconochie, 311, Fulham Palace Road, S.W., chemist. (C.C., 3/3/23.) £21 1s. 10d. January 15; and £20 9s. 8d. January 16.  
NOBLE, Mr. W. D., 2, Well Street, Cable Street, E., druggist. (C.C., 3/3/23.) £10 2s. 1d. January 17.  
OATES, John Alfred, 39, Cambridge Road, Cargo Fleet, chemist. (C.C., 3/3/23.) £10. January 18.  
STANSFIELD, Mr. J. L., Boothfold, Waterfoot, chemist. (C.C., 3/3/23.) £22 5s. 10d. January 18.

### Deed of Arrangement

HARRINGTON, William, 214, Cradley Road, Netherton, chemist. (D.A., 3/3/23.) Filed February 23. Trustee, D. Tanfield, 200, Wolverhampton Street, Dudley, C.A. Liabilities, unsecured, £922; assets, less secured claims, £162.

### Mortgages and Charges

[NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an \*—followed by the date of the Summary, but such total may have been reduced.]

CROSSLAND CHEMICAL REFINING CO., LTD., London, W.C. (M., 3/3/23.) Registered February 14, transfer of charge dated December 24, 1920, and a further charge securing £4,000 (including £1,750 due under original deed), to C. H. Oliverson, 37, Gloucester Square; general charge. \*£17,000. July 20, 1922.  
HOLLOWAY (GEORGE T.) AND CO., LTD., London, E., metallurgical chemists, etc. (M., 3/3/23.) Registered February 13, £250, £200, £150 and £300 debentures, part of £5,000; general charge. \*£2,900. January 12, 1923.  
LEYLAND PAINT AND VARNISH CO., LTD. (M., 3/3/23.) Registered February 15, £15,000 debentures; general charge.  
LLOYD (HOWARD) AND CO., LTD., North Evington, chemists. (M., 24/2/23.) Registered February 6, £500 further charge, to building society; charged on premises comprised in mortgage dated February 11, 1921. \*£3,500. February 17, 1922.  
PHILLIPS AND SON (CHEMISTS AND OPTICIANS), LTD., Wigan. (M., 24/2/23.) Registered February 3, charge, to bank; charged on 25, Wigan Lane and 144, Scholes, Wigan. \*— November 8, 1922.

### London Gazette

#### Bankruptcy Information

CRANSTON, Edward, trading as SANGLEY'S DRUG STORES, 314, Sangley Road, Catford, Kent, chemist. (R.O., 24/2/23.) Receiving order, February 13. Creditor's petition. Date of first meeting, February 27, 1923, 11.30 a.m., 29, Russell Square, W.C.1. Date of public examination, March 20, 1923, 11 a.m., Court House, Greenwich.  
THORNE, William Harold, 18, Beaconsfield Road, St. Albans, chemist. (R.O., 3/3/23.) Receiving order, February 22. Debtor's petition.

### Partnerships Dissolved

BAGGALEY AND HOWARTH (Frank HOWARTH and Frederick Harold BAGGALEY), chemical speciality manufacturers, 102, Palmerston Street, Ancoats, Manchester, by mutual consent as from January 1, 1923. Debts received and paid by F. Howarth, who will continue the business.  
BELL AND CO. (Henry Alfred NEALL and Frederick Ewart HARRISON), chemists, 22, Robertson Street, Hastings, by mutual consent as from December 25, 1922. Debts received and paid by H. A. Neall.  
EVANS AND LEWIS (Thomas LEWIS and David EVANS), chemists and druggists, 136, Chepstow Road, Maindee, Newport, Mon., and 6 and part 7, Dock Street, Newport, by mutual consent as from February 6, 1923. The business at 136, Chepstow Road will be carried on by D. Evans, and the business at 6 and part 7, Dock Street will be carried on by T. Lewis.  
GOULD AND CO., POTTS AND REES (David Morgan REES and Alfred Ernest SMITH), chemists and druggists, 62, South Audley Street, and 23, North Audley Street, by mutual consent. Debts due to and owing by Potts and Rees received and paid by D. M. Rees, who will continue the business. Debts due to or owing by Gould and Co. received and paid by A. E. Smith, who will continue the business.  
PARRY AND CRITCHLEY (Richard Ernest PARRY and William Edwin CRITCHLEY), chemists and druggists, 123, Granby Street, Princes Park, Liverpool, by mutual consent as from January 31, 1923. Debts received and paid by W. E. Critchley who continues the business.

### New Companies Registered

ALLAN CLEAVER AND CO., LTD., 1, East India Avenue, Leadenhall Street, London, E.C. Manufacturers of and dealers in chemicals, soap, metals and minerals, etc. Nominal capital, £1,500 in £1 shares.  
JOHNSON AND WEST, LTD., 46-47, Aldersgate Street, London, E.C.1. Manufacturers of chemicals and manures, distillers, dye makers, etc. Nominal capital, £1,000 in £1 shares.  
ALBERT LEE AND CO. (1923), LTD., 8 and 9, New Zealand Avenue, London, E.C. Manufacturers of and dealers in chemicals, glass, etc. Nominal capital, £6,500 in £1 shares (5,000 ordinary and 1,500 deferred).  
PENNINGTONS (LIVERPOOL), LTD., 424, Edge Lane, Liverpool. Manufacturers of and dealers in chemicals, cements, oils, paints, pigments and varnishes, etc. Nominal capital, £500 in £1 shares.  
PICTON AND LLOYD, LTD. Manufacturing chemists, bone crushers, grease manufacturers, etc. Nominal capital, £100 in £1 shares. Secretary: H. F. Fuller, Pendennis, Curzon Avenue, Beaconsfield, Bucks.  
SENTINEL OILS, LTD., 47, Essex Street, Strand, London, W.C.2. Dealers in petroleum and other oils and products thereof, etc. Nominal capital, £2,000 in 5s. shares.  
UNITED IMPORTS, LTD. Importers and exporters of dyestuffs and chemicals, etc. Nominal capital, £10,000 in £1 shares. Solicitors: Coburn and Co., 6, Drapers' Gardens, London, E.C.  
WALTON, WEBB, LTD. Manufacturers of and dealers in oils, spirits, colours, chemicals, etc. Nominal capital, £1,000 in £1 shares. A subscriber: H. H. Walton, 275, Croxsted Road, East Dulwich, London, S.E.

### A Colloid Research Laboratory for Manchester

The Council of the Manchester University have approved a scheme for the establishment of a Colloid Research Laboratory in the University. A sum of £11,842 has been subscribed and given to the University towards the endowment and cost of the equipment of the department. The Research Laboratory will be known as "The Graham Research Laboratory," and Mr. D. C. Henry, M.A., at present a Lecturer in Chemistry in the University, has been appointed Lecturer in Colloid Physics as from September next, and will take charge of the laboratory. The Council desire to express their hearty appreciation of the gift to the various subscribers, and especially to Dr. Kenneth Lee, who has been largely responsible for the scheme.



